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"Telephony's" Annual Review of Industry

Record of the Year 1929 Shows Many Interesting Developments in the Ever-Expanding Telephone Industry—Technical Attainment of Telephoning to Anyone Anywhere on Land, Water or in Air Demonstrated—World-Wide Activity

By Stanley R. Edwards,
Editor of TELEPHONY

Taking a "long look" over the telephone field, it would appear that the year 1929 was a normal year with few variations from the ordinary course of events which characterize an ever-expanding business.

All of the companies were busy and undoubtedly their annual reports will reveal, in the majority of the cases, an income in excess of expenses. Some of the companies did considerable rebuilding while others confined their activities to maintenance work and the improvement of the transmission qualities of their plants.

The increase in the amount of toll traffic noted in 1928 continued throughout 1929 and the smaller companies found that the volume of this business could be considerably increased by encouraging the use of this service and improving the transmission of the local exchange.

The efforts to increase the number of subscribers and to sell additional service facilities continued throughout the year with success. In fact, the service selling idea has now become a part of the program of most of the larger companies.

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On the whole, the relations between the various telephone companies and their state regulatory commissions were satisfactory. In some of the states, Ohio particularly, the work of the commissions was interfered with by changes in the personnel of the commission and in the regulatory laws. As the year ends, however, the commissions have completed their organizations and are functioning so that cases are being handled more promptly.

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It has long been the aim of the Bell system to provide a service so that anyone anywhere may talk to another person anywhere. This was demonstrated during the year to be technically possible, even if not commercially feasible at the present time in some cases.. The transatlantic service has been extended so that it now covers the greater part of Europe where formerly only the larger cities in different countries were reached.

It is expected that shortly after the first of the year, commercial radiophone service will be inaugurated with South America through a station at Buenos Aires and extended to other large cities such as Rio de Janeiro.

Commercial service was also opened late in the year with one of the ocean liners and this service, it is stated, will be extended to other vessels as there is a demand for it.

It has also been demonstrated that communication is practical between airplanes and wire lines. Probably the most striking proof of this took place in October, when communication was established from a plane going 90 miles an hour above New Jersey with the convention of the Telephone Pioneers of America at Minneapolis, Minn., and the office of the association's new president, J. S. McCulloch, in New York City.

The airplane was connected with both the land points by way of the radio transmitting and receiving station of the Bell Telephone Laboratories at Whippany, N. J., and then over the long distance lines of the American Telephone & Telegraph Co. Conversations were held with the pilot of the plane from both points and also between New York and Minneapolis through the plane.

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On December 22 another demonstration was made using a big tri-motored airplane Flying at the rate of 100 miles an hour over New York City at an elevation of 3,000 feet, two press reporters and three engineers of the Bell Telephone Laboratories, asked for and got the S. S. Leviathan 500 miles out at sea, as if they were calling for a number just around the corner.

This new step in communication was effected by a radio-land wire-radio hook-up. There was hardly any static, the voices coming through almost as distinctly as over an ordinary telephone circuit.

Thus has been demonstrated during the year the ability to talk with persons over the sea, on the sea and in the air.

It also might be noted that radio telephone service has been installed in its airplanes by one of the air transport companies operating between Chicago and San Francisco, whereby the pilot of airplanes may communicate with company stations along the route. Information regarding air conditions may thus be obtained and instructions given the pilot. Thus considerable time may be saved due to it being unnecessary for the plane to land to obtain information.

An Expanding Industry.

The total number of telephones in the United States at the close of 1929 is in the neighborhood of 20,212,000, a gain during the year of about 870,000 telephones, as against about 818,000 the preceding year. About 4,100,000 telephones or 20 per cent of the total, are of the dial type. Of the total number of telephones approximately 123,000 do not have toll connections with the lines of the Bell system.

The number of telephones in the entire world is estimated to be 34,000,000, an increase of about 1,200,000 during the year.

The Bell system has spent about $600,000,000 for construction and improvement during the year and in 1930 it has been announced that approximately $700,000,000 will be expended. To make this more impressive, it might be stated that during every hour of 1929 the Bell system spent approximately $690 on improvements and construction and during 1930 it will spend at the rate of $800 an hour.

With the Manufacturers.

The manufacturing and supply branches of the industry have had a good year. Improvements, however, which should have been made in a number of exchanges were not effected. This probably was due in some instances to some of the companies expanding too rapidly and not being able to organize sufficiently in time to draw up plans for improvements of exchanges. In other cases, some owners evidently put off rebuilding in the hopes of disposing of their interests.

On the other hand, in Missouri, Illinois, and Iowa particularly, individual owners and some of the syndicate companies spent considerable sums in erecting new telephone buildings and installing new equipment.

Undoubtedly in the coming year there will be considerable more rebuilding and improvement work done by the syndicate companies as their staff organizations are perfected. President Hoover's action to encourage industry to go ahead with projected plans also will have its influence in the telephone field. The Bell companies have announced increases in their expenditures for 1930 and a number of the Independent companies likewise have stated their intention of doing work now that had been projected for a couple of years from now.

The State Associations.

The conventions of the different state associations during the year were more largely attended than in the past. There was also greater interest taken in the programs, indicating that the people in the operating field are more desirous than ever of keeping abreast of developments in their particular branches.

Practically all the state associations held district meetings, at which, in addition to general topics concerned with management, traffic, accounting and transmission, individual problems were taken up and discussed.

The matter of transmission was given attention in a number of states. Demonstrations were put on not only at the state conventions but also at district meetings, illustrating how conditions creating a considerable transmission loss may be removed with practically no expense outside the time involved in testing.

Another activity consisted of demonstrations showing the value of adhering to standard construction practices in joint use of poles. During the year, thousands of telephone and power men, through demonstrations of the power arc follow-up, have had impressed upon them the necessity for safety methods for employes and equipment.

The Ohio Independent Telephone Association as a means of encouraging better maintenance practice and better service, created an honor award. This award was given to a number of companies as a recognition of better service by the employes or the improvement of plant. Companies to whom awards were made received a great amount of publicity from their local papers and thus the attention of the public was drawn to the efforts of their local company and its employes in providing them with a good grade of service.

This award has had an excellent effect upon the personnel of the companies and has also been influential in improving the public relations.

Sales and Transfers of Property.

The buying movement, which in the past few years has been of great prominence, was not so much in evidence in 1929, particularly among the smaller companies. There were a number of sales of syndicate companies, some of which were not on a firm financial basis, and some reorganization among other syndicate companies.

The larger syndicate companies apparently were devoting their activities to strengthening their positions through consolidation of their holdings into one operating organization instead of a number of separate companies. In this way the situation in many states has been clarified and confusion due to similarity of names eliminated.

Operating organizations are being formed gradually by the syndicate companies, and the coming year should see the bringing about of well-defined organiza-

COMING CONVENTIONS.

South Dakota Telephone Association, Watertown, Hotel Lincoln, January 14, 15 and 16.

Arkansas Telephone Association, Little Rock, Gleason Hotel, January 20 and 21.

Minnesota Telephone Association, Minneapolis, Radisson Hotel, January 28, 29 and 30.

Nebraska Telephone Association, Omaha, Hotel Paxton, February 11, 12 and 13.

Oklahoma Utilities Association, Tulsa, Mayo Hotel, March 11, 12 and 13.

Texas Independent Telephone Association, Fort Worth, Texas Hotel, March 18, 19 and 20.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 8, 9 and 10.

Ohio Independent Telephone Association, Columbus, Hotel Deshler-Wallick, April 15, 16 and 17.

Indiana Telephone Association, Indianapolis, Claypool Hotel, May 6, 7 and 8.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 13, 14 and 15.

Up-State Telephone Association of New York, Rochester, May 21, 22 and 23.

tions and the formulation of plans, and their carrying out, for the improvement of those plants in which maintenance has not been kept up, owing to the changes in ownerships. Of the systems now in the operating field, two of them have attained considerable size, each operating in the neighborhood of 500,000 telephones.

An indication that the end has been reached in the paying of extraordinarily high prices for telephone properties is seen in the failure of one of the syndicates operating in Ohio to carry out option contracts on several properties. About $1,800,000 is reported to have been forfeited by failure to exercise options, but about half of this amount is being held awaiting the outcome of legal proceedings for its return.

Independent-Bell Relations.

The relations between the Independent companies and the Bell companies continued along the same line of cooperation that has prevailed for the past several years. The executive committee of the United States Independent Telephone Association held several conferences with officials of the American Telephone & Telegraph Co. for the discussion of matters of mutual interest and for clearing up disputed points. Among these latter are the questions of Bell companies owning and acquiring minority interests in Independent companies and of the proper handling and future development of the toll business.

The conference method of handling the various matters which come up between the Independent and the Bell companies has worked to the advantage of both groups of the industry in that the problems of one are much better understood by the other group.

Purchases by Bell.

During the year there have been a number of purchases of Independent properties by the Bell companies, and the Bell companies have also disposed of some properties to the Independents.

Since January 1, 1929, the Bell companies have acquired 16,781 stations in 77 exchanges. Of these, 2,944 stations in 15 exchanges were at competitive points. These competitive points were Jackson, Tenn., Hammonton, N. J., Benton, Ky., and 12 exchanges of the Susquehanna Valley Telephone Co. of Williamsport, Pa. In addition to the stations and exchanges acquired by the Bell companies 1,700 service stations were purchased by them during the year. These were mainly in Pennsylvania where the rural telephone situation is being cleared up.

It is estimated that the Bell companies transferred about 5,000 stations to the Independents, the exact figures not being available.

Investigation of Communications.

As a result of the introduction in Congress of a bill providing for a federal communications commission an investigation by the Senate interstate commerce committee of wires, cables and radio, was authorized in connection with the committee's hearings on the communications bill.

Hearings were commenced by taking testimony relative to radio last spring. As the year closes, the testimony on radio has practically all been taken. It is expected that the Senate interstate commerce committee will turn its attention to the telegraph and telephone shortly after the beginning of the new year.

The opinion expressed by those testifying before the committee was generally opposed to the inclusion of telephones and telegraphs with radio in the communications commission. This is based on the belief that the radio situation has not been as yet sufficiently clarified to permit its regulation and supervision in connection with other communications interests.

Rate Cases.

Decisions were rendered in two rate cases which had been before a commission and a court for several years. In November the California Railroad Commission issued an order in the San Francisco Bay district rate case of the Pacific Telephone & Telegraph Co., which had been before the commission for more than two years. The company was granted an increase which the commission estimated would allow it a 7 per cent return.

In another decision the California commission issued on the same date, the Pacific company was directed to decrease its rates in the Los Angeles area, a total amount of approximately the same as the increase authorized in the San Francisco area. This decrease, it was estimated by the commission, would reduce the company's earnings in the Los Angeles territory, from over 9 per cent to about 7 per cent.

In these decisions, for the first time the so-called "ceiling rule" was applied. This means that a company having a far-flung business in the state, which is on a reasonable and normal earning basis as a whole, may not pick out one section where its earnings are subnormal and secure a rate increase there without expecting a decrease somewhere else, so that its overall state earnings will not be augmented.

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At about the same time in November, the special federal statutory court in New York authorized the New York Telephone Co. to increase its rates so as to earn an average of 7 per cent on its invested capital. The federal court decision resulted from an action commenced by the New York Telephone Co. in April, 1924, in seeking relief from rates established by an order of the New York commission in 1923.

Hearings before the master in the case commenced in October, 1924, and ended in September, 1928. The testimony was taken in 710 hearings and came from 609 witnesses. It covered more than 36,000 pages and included 3,288 exhibits. The master's report in the matter was filed in March, 1929, and in the main upheld the telephone company's contention.

The master fixed a return of 8 per cent on a valuation of $518,109,584. The federal court in its decision reduced the valuation of $397,207,925, and fixed the return at 7 per cent.

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In Ohio, the hearings on the state-wide rate case of the Ohio Bell Telephone Co., which were commenced in 1926, were resumed in January. Owing to changes in the commission, the hearings were discontinued but this month the commission again resumed work on the case.

Another rate case in which the Bell was involved is in San Antonio, Texas, where the matter is now before the federal court. During the year, hearings were held before a master and briefs filed by both sides.

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In March, the Michigan Supreme Court ruled that the Michigan Bell Telephone Co. in fixing its rates in that state, cannot deduct as expenses the 1½ per cent of gross earnings paid to the American Telephone & Telegraph Co. This decision was in answer to a quo warranto suit started by the state as the Michigan Bell company and the A. T. & T. Co. refused to produce the detailed figures to show what advantages accrue to the Michigan company in return for the 2 per cent payment provided in the contract at that time.

During the summer, final arguments were made before the special federal statutory court in Chicago in the injunction

case of the Illinois Bell Telephone Co. relative to certain rates in Chicago. The case is under advisement by the court.

Another case in which the Illinois Bell Telephone Co. is concerned is the matter of its franchise in Chicago, which expired last January. Negotiations have been in progress with a city council committee during the year, and as the year closes both sides are reported approaching agreement on the main details of the franchise.

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In the earlier months of the year, there was considerable agitation against the Bell company in the Oregon and California legislatures. In Oregon, two memorials to Congress were passed by the legislature, asking that a federal investigation of the American Telephone & Telegraph Co. and its subsidiary companies be made.

Independent companies in different states during the year had a number of rate applications before their respective commissions. Generally, when the cases were properly prepared and presented to the commissions, the applications were granted, for the rates applied for were only such as to bring their level up to the rates of companies in adjacent territory.

Long Distance Service.

During the year, improvements in the methods of and facilities for the handling of long distance service were made, thus extending the number of points to which rapid service could be obtained.

Rate reductions for long distance service were announced by the Bell system early in the year, effective on February 1. These reductions amounted in the aggregate total to about $5,000,000. Another reduction was announced early this month, effective January 1, which will amount to a total of $5,000,000.

These various reductions, the last of which is the fourth made in a little over three years, have, in connection with the fast service, been responsible for the large increase in the use of toll service.

Toll Cable Networks.

In connection with the toll service, the Bell associate companies are engaged upon a program of constructing inter-city toll cable networks. The Pacific Telephone & Telegraph Co. is in the midst of a cable-placing program for the Pacific coast, which, by 1933, will link cities from the Canadian line to the Mexican line. This cable building program will cost about $30,000,000 and will multiply its city-to-city facilities in some cases 20 times over.

The Southwestern Bell Telephone & Telegraph Co. is engaged on a $50,000,000 inter-city toll cable network, extending from St. Joseph, Mo., on the north to San Antonio, Texas, on the south, and from Memphis, Tenn., on the east to Sweetwater, Texas, on the west, with branches and extensions to many other important cities.

The Indiana Bell Telephone Co. is laying a cable between Indianapolis and Kokomo, underground, and later it will be extended to South Bend.

In Iowa, the Northwestern Bell Telephone Co. is engaged on a large inter-city underground cable project. In other states, such as Michigan, New York, Pennsylvania, the various Bell companies have their cable network projects well started towards completion.

Practically all this cable will be laid underground, some of it in vitrified clay conduit, some in fibre conduit and some "buried" without use of conduit. The "buried" cable used by the Bell companies is a new type of toll cable known as "tape armored" cable. It is a full-sized standard toll cable having 148 quads No. 19 gage, 1 quad No. 22 gage, and 6 pairs No. 16 gage, the latter being for special service such as picture transmission and radio program transmission.

The lead sheath of this cable is covered with a wrapping of 0.007 inch paper. This is followed by two layers of jute and two wrappings of a steel tape 2 inches wide and 0.04 inch thick. The steel tape is wound on the table with 0.5 inch facing. The second is so arranged as to cover this gap.

Over this armor are placed two more layers of jute, the outer cover being painted with whitewash to prevent adjacent layers from sticking together on the cable reels. The jute and paper coverings are thoroughly impregnated with an asphalt compound.

In adoption by the Bell companies of the plan of using "buried" cable, it is interesting to note that Independent companies in the smaller towns have for a number of years used "buried" cable.

Other recent instances of where equipment or practices of the Independents have been adopted by the Bell in some form or other might be mentioned, such as the use of the Strowger automatic or "step-by-step" equipment, as it is termed by the Bell; the handset instrument now so much in favor, particularly in the larger cities; and the feature switchboards which were brought out by the Independent companies some 12 or 15 years ago.

In placing the buried cable, the Bell company has secured private rights-of-way so that danger of it being cut into or otherwise disturbed is practically eliminated. The cable placed in conduit, follows generally the route of state roads or other direct highways.

The long distance cable lines of the American Telephone & Telegraph Co. which now reach Davenport, Iowa, from the east, will be extended across the state. At present the cable has been laid as far as Iowa City and is scheduled for completion in 1931. Along the Atlantic seaboard the toll cables of this company now extend southward into North Carolina.

Service in Rural Communities.

The problem of service in rural communities has received a great deal of attention during the year and definite steps have been taken toward its solution. The general opinion seems to be that rural service has fallen far behind the development of service in the larger places.

In fact, a comparison might be made between the modern all-electric radio set and the battery-operated radio receiver. During the past three years great improvements have been made in the electrically-operated radio, while the battery-operated set has been neglected and is, from point of development, at the same stage it was several years ago.

Thus it is with the telephone service in the average rural community. It is practically in the same stage of development that it was 20 or 25 years ago. To advance it from this condition, leaders in the telephone field believe that a real educational campaign is required, and a desire created for improved modern telephone service.

As indicative of this, a number of companies are changing gradually their grounded line circuits to metallic circuit and are offering common battery service in place of the magneto. The companies which have inaugurated common battery service in the smaller places are finding that it meets with the approval of the public and that they are willing to pay the increased rates necessary for such service.

In the states west of the Mississippi River particularly, the rural lines are pre-

dominantly of the grounded circuit type, which up to comparatively recent years provided a fairly good service. As the country developed and electricity was introduced into the smaller towns with lines extending between towns, the grounded circuit service grew less and less satisfactory, and transmission over many of these lines is now very poor. The increasing number of power transmission lines operated at high voltages is forcing the changing of many grounded telephone lines to metallic circuits.

This change is, of course, expensive because two new wires have to be placed, for it is not feasible to utilize the existing wire of the grounded circuit because of high resistance joints and other conditions which would cause an unbalanced line. Hence commercial companies are doing the work of changing gradually and in sections where the service on the grounded circuits is poorest. In one state alone it is estimated that it would cost $10,000,000 to change the rural circuits of the Bell company.

The problem of the rural lines differs in the various sections of the country, but it is one that the telephone companies are attempting to solve according to their respective situations.

New Business Development.

The movement inaugurated about two years ago for developing increased business and new sources of revenue attained great force during 1930. Probably every telephone subscriber in the country was approached with some suggestion whereby he would obtain more efficient use of his telephone service at a slight increase in the amount paid. In some cases party-line service was changed to single line or four-party to two-party service.

The advantages of extension set service were not overlooked and the number of extension sets installed was greatly increased. In the case of business organizations, studies were made to indicate whether additional lines were required or P.B.X.'s would be more satisfactory.

The idea of more than one telephone to a home was vigorously set forth in magazine and newspaper advertisements and in numerous articles. Two or more extensions were advocated and their convenience stressed. Special efforts were made to reach architects and prospective builders of homes so that plans for new houses would include wiring for telephones located in bedrooms, kitchen, living room and other accessible and convenient locations.

The idea of "two telephones" undoubtedly will be vigorously pushed by telephone employes in the future, contrasting with the two automobiles for the family.

In the line of increased revenue, secretarial and stenographic services are being furnished experimentally by some telephone companies.

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In New York and Chicago and in other large cities, secretarial service has been supplied by special bureaus having no connection with the telephone company, such as the physicians' exchange.

Business and professional men having offices unattended in their absences make use of such exchanges through notations in the telephone directory that a certain number be called in case no answer is received from the regular number. They then keep in touch with this exchange or bureau, and receive any messages that have been left.

Telephone companies, experimenting with secretarial service, have arranged that when a person leaves his office, he notifies the telephone operator, and she transfers all calls for his number to a special desk where a record is made of it or information given. Many business men are finding this service of great value and are willing to pay well for it.

An extension and expansion of this secretarial service provided by the telephone company is seen in its substitution for P.B.X. service in apartment houses. This substitution will mean the addition of a large number of new subscribers for telephone service instead of only one, as is the case when a private branch exchange switchboard is installed. This naturally will apply more particularly to new apartments.

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Another step along the line of special service is the supplying of stenographic service by the telephone company. This involves employment of expert stenographers by the telephone company to whom dictation is given over the telephone. They are supplied with the necessary stationery by subscribers to the service, and letters may be mailed direct or sent by messenger to the subscriber.

In the campaign for new business the companies have also kept in mind the need for making their business transactions more personal. In many of the business offices in the new telephone buildings erected during the year the counter, over which it has been the custom for many years to transact business, is eliminated.

Under the counterless arrangement, customers coming to the office are seated beside desks at which the company representatives give their affairs prompt and courteous attention. The customers have the feeling that they are transacting their business on a more personal basis and in an atmosphere of comparative privacy.

Telephone "Record" Service.

During the year the telephone typewriter service has been installed for many business houses. Although the Independent companies were not able to do much with this service the greater part of the year, toward the close of the year they became very much interested in it and undoubtedly the future will see the Independent companies pushing the sale of this class of service.

As this is a form of service which is known as "record" service, it is of interest to note the testimony given relative to this class of radio service in the investigation before the Senate interstate commerce committee. Speaking of facsimile radio transmission, William A. Winterbottom, vice-president of RCA Communications, Inc., said:

"This new method promises some day to

Essential Requisites of a Self-Educated Man.

Major requisites to an education:

1. Able to speak and write the mother tongue correctly.

2. Able to do something worth while well.

3. Able to think straight.

Minor requisites:

1. Able to get along comfortably with others.

2. Able to do constructive "Dreaming."

3. Acquire historical knowledge.

4. Recognize supremacy of spiritual motives.

So if we set before ourselves each of these objects and then day by day provide our own tests to see the extent to which we measure up, we will find in the passage of time that one by one we become more skillful, we attain more completely, more perfectly, each of these requisites which go to make up the educated man.—Wm. B. Needles, before Executives' Club of Chicago.

completely revolutionize the art of record communication. The RCA has spent over $1,000,000 on facsimile development, and must keep on spending because the present stage of development promises so much for the future. I have seen facsimile inventors in England, Germany and France, all busily working on the solution of this one problem. Last month a facsimile service was inaugurated between Germany and Argentina, using German apparatus."

With the installation of telephone typewriter service, the American business man is becoming familiar with record communication and educated in its use. If the facsimile transmission becomes the factor which Mr. Winterbottom indicates, the telephone companies should certainly be in excellent position to take advantage of its application to wire circuits.

Program Service.

The interest in program service continues among those in the Independent telephone field. Those engaged in it, however, are proceeding carefully because of the patent situation and also uncertainty as to what may be developed in the line of legislation in Congress in connection with the federal communications bill.

Although testimony was given the Federal Radio Commission last March that a company expected to commence furnishing program service in Cleveland, Ohio, in May, no progress has been made in commercial installations, so far as can be ascertained.

Several hotels in Chicago and New York have provided program service for patrons in their rooms. This service is individual to the hotel, the hotel having made the installation of the receiving and retransmitting equipment. Choices of three programs, as a rule, are provided. In St. Paul, Minn., program service to several hotels is provided by the program service company operating there.

The American Program Service Association took action during the year whereby its members become members of the United States Independent Telephone Association which has created a program service division. Thus the program service interests become more closely allied with the telphone interests.

Dial Telephone Development.

In the field of dial telephone development, progress has been marked not only by a continuance of the processes of conversion established in the past few years, but also by improvements in standardization of switching equipment, as well as those inevitable refinements that tend to lengthen life and lower maintenance costs.

In the small automatic exchange field there has been a notable tendency towards greater standardization and concentration of design to a relatively few types. This has been made possible largely because of the greater commercial application along these lines, the number of small exchanges placed in service this year being more than double the number installed during any previous year.

Perhaps the most outwardly visible improvement in dial switching equipment has been the improvement in frame design and mounting methods, resulting in greater flexibility in the adaptation of equipment to floor spaces of various sizes and to various ceiling heights. An example of this was the installation this year at St. Paul, Minn., of step-by-step type equipment on 11 ft., 9 in. frames, the first of the kind to be placed in service in this country.

In the same class of improvement is the development of the so-called sectional method of mounting for small exchanges, permitting the expansion of a switchboard either vertically or laterally, by means of switch shelves of uniform design and dimensions.

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During the fall, the Bell Telephone Laboratories demonstrated a new apparatus called the optical phonograph call announcer. The present operating practice for handling calls from a dial exchange to a manual exchange includes a visual call indicator on the manual switchboard. On this indicator appears the number which the subscriber has dialed, thus informing the operator the number with which to make connection.

With the optical phonograph call announcer the number dialed by the subscriber is translated into spoken figures to the operator. The operator is thus relieved of the necessity of glancing down at the flashing numbers in order to determine the number dialed. When she is free to take a call, she merely presses a button and the called number is spoken into her ear.

This method is faster and easier than the visual method, as it permits the operator to keep her eyes always on the multiple board. It is to be installed in three manual exchanges in New York City at once and its use undoubtedly will be extended to other exchanges.

The spoken numbers are produced by talking films which were made by a girl considered to have the clearest voice among New York City's operators. The films, of which there are 10, one for each of the numbers from zero to nine, are wound on drums which are made to revolve automatically upon the dialing of the number.

Television.

Television still remains in the laboratory, although in late June it was taken out for a demonstration by the Bell Telephone Laboratories. This demonstration was of television in color.

While there is some television broadcasting, such transmitting is experimental and is being maintained for the purpose of solving the difficulties and problems that would come up in the regular operation. From time to time, newspapers publish stories relative to television receivers for home use, but it is not considered likely that television will be in the commercial stage for some time to come. The problems of television have been analyzed and this is a definite step in its progress.

Various other interests in addition to the Bell are at work on television, particularly with the idea of broadcasting it as part of radio programs. Among these organizations are included the Baird Television Co., the General Electric Co., and the Westinghouse Electric & Mfg. Co. All are making substantial progress in this new art.

One analysis of the present trend in television published recently says that indications are very clear that the first means of obtaining subject matter will be through the use of the talking picture films. The next step will probably be the photographing of outdoor scenes, and, by means of a quick-developing film transmitter, put them very shortly on the air.

Several methods of doing this are now in process of completion and give good promise of success. Following this, broadcasting of events as they occur seems logical. This, however, seems to be much more distant than either of the two other methods of securing subject matter.

Anniversaries in Telephone Field.

The telephone industry is now old enough to have "Birthday anniversaries." The increasing lists of members of the Independent Pioneer Telephone Association of United States and the Telephone Pio-

neers of America bear testimony to the number of men and women who are attaining the rank of "Pioneers of the Industry" as indicated by the length of their service.

The Illinois Independent Telephone Association in November observed its silver anniversary, and this month the Lincoln Telephone & Telegraph Co., of Lincoln, Neb., observed its 25th anniversary by honoring its founder and president, Frank H. Woods, at a banquet.

This month also the Southern Bell Telephone & Telegraph Co. celebrated its golden anniversary and the installation of its millionth telephone. On December 11, meetings of employes were held at central points in each of the states in which the company operates and each meeting was connected by a network of long distance wires to a meeting in Atlanta. The Atlanta program was heard distinctly in each of the distant cities and was followed in each place by local celebration.

Transatlantic Circuits.

In the transatlantic telephone service there are now employed two short wave circuits and the original long wave circuit. The service is now on a 24-hour basis and the amount of traffic continues to increase.

During the year, work on the telephone cable to be placed under the Atlantic Ocean has progressed and some details relative to it have been given out. It is expected that the cable will be placed in service early in 1932. The new cable will yield only one additional telephone channel, but it will be of maximum reliability, free from the radiations characteristic of the radio circuits. It is probable also that a superposed telegraph channel will be obtainable.

Already, arrangements have been made for terminal points in Newfoundland and in Ireland near Ballina. The distance between these points is approximately 1,800 nautical miles. From Newfoundland to Nova Scotia the circuit will be carried through several sections of submarine cable and then by land circuits through Nova Scotia, New Brunswick, and through the New England states to New York City. From Ireland, the circuit will probably be carried through submarine cable to Scotland and then by land cable to London.

The ocean bed off the coast of Ireland in line with the point where the cable will land, has been carefully tested by engineers of the American Telephone & Telegraph Co. in preparation for the new cable. The chief aim of the tests is to ascertain if there are any deposits of iron ore which, if found in any considerable quantity, would seriously interfere with the working of the cable. So far the tests have proved satisfactory. Test cables in 20-mile lengths are used and were joined up as the work progressed.

In connection with transoceanic telephone, the demonstration in late September whereby officials of the Bell company and others telephoned from New York City by way of England to Australia, a distance of 15,000 miles, is of interest. The demonstration showed that the telephoning over such distance is practical, but it is not likely that it will be done commercially for some time to come.

Radio and Wire Services

Eventually wire service will be extended to every part of the world where business conditions make it economically advantageous to do so.

Unless someone invents a new method of radio transmission, radio will always be in the position of a pioneer, to be displaced by wires as soon as the economic situation warrants.—Dr. Frank B. Jewett, president, Bell Telephone Laboratories.

Telephones in Foreign Countries.

Outside of the United States, there has been great activity in telephone construction and installation in many countries. The activity may well be said to be world-wide for telephone communications are well on the way to girdle the earth.

In England, the number of stations in the British Post Office system has shown a steady increase from month to month, so that the total at the end of the year was in the neighborhood of 1,850,000 telephones. The conversion of the London system to automatic has progressed and some 20 automatic offices are now in operation.

During the year, the Isle of Man in the Irish sea, was brought into telephonic communication with the rest of Great Britain. The cable was also extended to Belfast, Ireland, so that uninterrupted telephone service is now provided between these islands.

Long distance service has increased between the countries of Europe and the methods of handling the traffic improved so that the time is considerably lessened. The work of the International Committee on Communications has been a considerable influence in this development. The local service has also come in for considerable expansion, due to the increasing use of telephone service.

Communication has been established between Europe and other continents by means of the beam radiophone system Several cities in Holland have public telephone booths installed in their chief telephone buildings and communication may be had from them with cities in the Dutch East Indies. During the first six months of the year there was a total of 1,461 calls over these radio telephone circuits. In June there were 71 calls from the Netherlands to the Dutch East Indies and 167 in the reverse direction.

Radio telephone service was inaugurated between London and Buenos Aires on July 19. The service, however, is limited at the present time, being restricted to the period between 5:30 and 9 p. m.

On October 12, commercial service was established between Madrid, Spain, and Buenos Aires, South America. This is not a booth service between the two cities but is arranged for connection to the local telephone networks at each of the terminals. The distance covered by this public telephone line is approximately 6,400 miles as against the 3,200 miles from England to America.

During the year, a telephone cable was laid between Finland and Sweden, having a length of 150 miles of which 132 miles is submarine cable.

Australia and New Zealand both reported increased use of the long distance telephone, due somewhat to more extensive use of the telephone in the social and business activities of the community. Probably, however, the largest contributing factors were increased speed of service, improved quality of transmission and the greatly extended range of service that has been provided during recent years.

In South America, English and American interests have been active in acquiring control of systems in the various countries or have obtained concessions for local and long distance projects.

This activity has resulted in the modernization of a number of systems and the making of plans for long distance lines between the various countries and also between individual cities of a country. Thus as the business of South America develops, the telephone service, both local and long distance will be adequate for its needs.

Airplane-Ground Radiophone System

Installation of Radiophone Equipment Being Made on Transcontinental and Pacific Coast Air Mail-Passenger Routes Operated by Large Transport Organization—Chain of Stations Along Boeing Routes Known as the "Red Chain"

By Robert Johnson

Radio telephone communication between planes and the ground and between planes in flight has been perfected by radio engineers of the Boeing System, and installation of the radiophone equipment is being made on the transcontinental and Pacific Coast air mail-passenger routes operated by the large air transport organization. This system will be fully installed on the transcontinental line by the first of the year, and on the coast route shortly thereafter.

By means of the plane-ground communication system, pilots flying planes at an altitude as high as 12,000 feet are able to converse in normal tones of voice with operators at ground stations as distant as 200 miles. It is possible to exchange conversations at a greater elevation than 12,000 feet, but the Boeing experiments were temporarily halted there because that altitude is over the maximum required for planes flying the two routes.

Such a system increases the speed of an airplane schedule by better directing the route followed to evade storms, and by reducing the ground time, especially in times of bad weather and at night. Weather reports are transmitted directly to the plane as soon as received, whereas in the past a landing had to be made and a telephone call placed to get the weather reports on the route ahead. Time on the ground is the most expensive time lost in the air transport schedule today. The radiophone apparatus also permits traffic officials and pilots to be constantly in touch with each other.

The Boeing System, the largest operator in the nation in point of mileage flown, has completed eight million miles of flying since starting operations. Transporting ail mail, passengers and air express over the two longest lines in the United States, the Boeing System has developed its radiophone to increase the efficiency of its operations and to materially raise the safety factor of its equipment.

PILOT JONES SHIP NUMBER 286 EASTBOUND. WHAT ARE WEATHER CONDITIONS AHEAD ?
ALL STATIONS BETWEEN HERE AND OAKLAND REPORT CLEAR WEATHER. OAKLAND REPORTS RAIN STORM APPROACHING FROM NORTHEAST.
WEATHER MAP

Illustration of Airplane Pilot Reporting to Control Station and Ascertaining Weather Conditions.

With the development of short-wave radio telephony and recent advances made in shielding practices, results in experimentation were such as to warrant the present installation of radiophone equipment on the two Boeing routes. Problems in the way of successful telephone communications with airplanes were those involved in providing sufficient electrical power in the plane to modulate intelligibly a carrier for distant transmission and the development of super-sensitive receiver capable of picking up and amplifying, without distortion, weak signals far below the level of ordinary broadcast signals.

It was necessary to suppress below this level the interference of noises and electrical disturbances on the plane itself. A method of completely bonding and shielding the airplane was developed to prevent such interference. All planes now constructed at the Boeing Airplane Co. are fully bonded and shielded so that the radio installation may be easily made.

Boeing Airplane Pilot Demonstrates Radiophone "Mike": In Order to Permit Pilot Free Use of His Hands for Controlling Plane, Boeing Radiophone Engineers Developed Special Microphone Attached to the Headset on the Pilot's Helmet. The Plane Set Is Practically Automatic in Operation, and to Change from Transmission to Reception, the Pilot Merely Turns a Switch.

The total weight of the radiophone set installed in the plane is 100 pounds. An adequate antenna for transmission, and one kept physically as well as electrically from the counterpoise of the airplane structure, proved to be an eight-foot dural post, mounted vertically on the upper wing and streamlined to lessen wind resistance.

Power for the transmitter is taken from the double voltage generator on the engine. The entire equipment is nearly automatic in operation, requiring no adjusting on the part of the pilot. He may change from transmission to reception with a simple turn of a switch.

The first installation made by the Boeing System is in the 18-passenger tri-motored transports with which a 20-hour all-plane service will be inaugurated shortly between Chicago and San Francisco. These plans will also be equipped for the radio beacon service, which is the dot-dash system of communication supplied by the Department of Commerce from strategically located points along the transcontinental route.

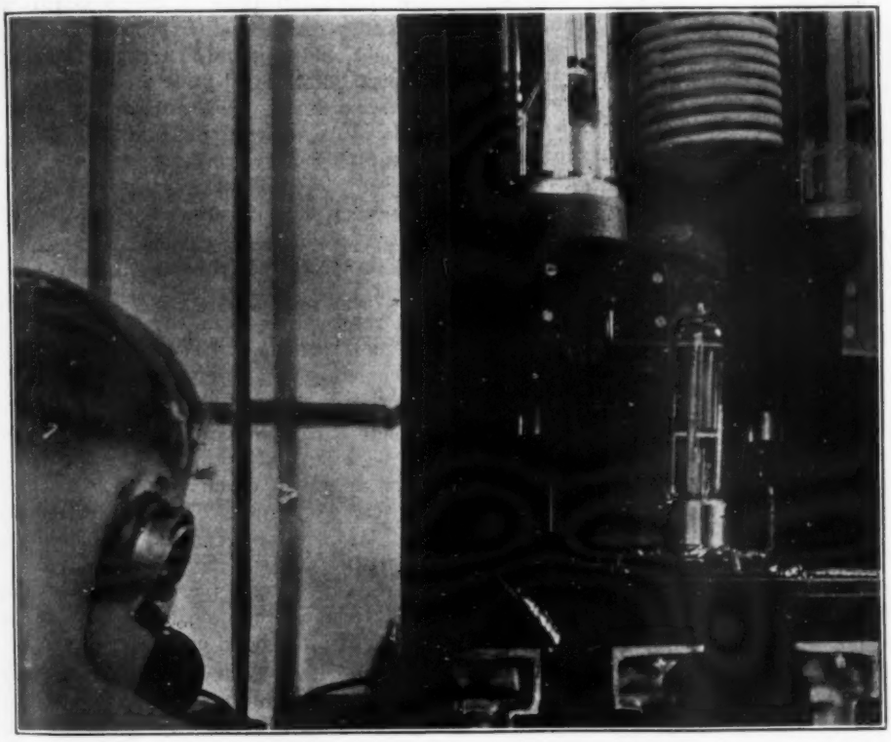
The Boeing chain of stations along its two routes is known as the "Red Chain," a designation made by the federal radio commission. Ground stations, consisting of equipment weighing 1,500 pounds, will operate on a frequency of 5,660 K. C. during the daytime and 3,142 K. C. at night. Un-

der the permit granted for the construction of these stations, the Boeing System, which will construct and own the equipment, must make its services available to other transport lines and to the itinerant flyer. All Boeing stations will be able to receive on a frequency of 3,106 K. C., which is the national calling frequency.

The positive advantages of the Boeing radiophone system are listed as follows by Thorp Hiscock, Boeing System radio engineer:

Adds much to the safety of flying; reduces number of emergency landings due to uncertainty as to weather ahead; enables pilots on regular routes to complete a larger number of scheduled trips on time; increases the pay load of mail-express and passengers by reducing the amount of excess gasoline formerly carried to give the pilot ample cruising radius when he is uncertain as to weather; valuable in dispatching planes and giving orders to pilots in the air.

The equipment now being installed by Boeing System was manufactured at the Philadelphia plant of the Western Electric Co. according to Boeing plans and specifications.



Operator and View of Radiophone Equipment in Boeing Station: With Transmitting and Receiving Apparatus Weighing 1,500 Pounds, This Operator Can Converse with a Pilot in a Boeing Radio-Equipped Airplane 200 Miles Distant and 12,000 Feet Above Sea Level. Boeing System Has Installed a Total of 22 Ground Stations Along Its Transcontinental and Pacific Coast Routes, and Pilots Flying from Chicago to San Francisco Bay Will Constantly Be in Voice Communication with the Ground.

Conference to Consider Policies Governing Sea Communications.

The advent of commercial ship-to-shore radiotelephony has created a new problem in radio regulation, since no channels specifically have been set aside for its use, and further development, it was stated orally December 18 at the Federal Radio Commission, coincident with the calling of a general conference for January 14 to discuss this and related questions.

At the conference, to which all persons holding licenses for general public maritime mobile and coastal services and all applicants for such services have been invited, the advisability of formulating new policies to govern frequencies in the maritime and mobile and coastal services will be considered. Major consideration will be given to suggestions, made by the commission's engineering division, that the policy, adopted May 10, for the distribution and licensing of such frequencies, be modified.

At present, five frequencies tentatively have been allocated the American Telephone & Telegraph Co. for use in maintaining a ship-to-shore radio-telephone service between the American steamship "Leviathan" and the shore. Under this system each of the 20,000,000 telephones in the United States connected to the Bell system, is available for direct connection with the "Leviathan."

No channels specifically have been set aside for the expansion of this service to other vessels, and for the applications for them that are bound to follow, it was explained.

Questions pertinent to mobile and coastal services also will be considered. These include the possibility of redistribution of frequencies among present licensees to obtain maximum service in ship-to-shore radiotelegraph communication, and the feasibility of allocating, for short-range coastal service, frequencies in the band 1,500 to 2,750 kilocycles.

This service would be between tugs and auxiliary vessels and shore, which ply only within harbors or close to land, and do not require the use of channels adopted for long-distance communication.

Telegraph and Radio Commission Bill Introduced in House.

Representative Celler, of New York, on December 4 introduced a bill in the House providing for a commission of five members to regulate interstate telegraph and radio communication and the transmission of electrical energy.

Mr. Celler's bill would provide for the appointment of the commission by the President, with the approval of the Senate, each member to be chosen from one of five zones, into which the United States and its possessions would be divided by the measure.

The commissioners would serve terms ranging from two to six years at an annual salary of $10,000, but their successors would continue in office for six years.

President Signs Bill Prolonging Life of Radio Commission.

President Hoover on December 19 signed the bill (S. 2276) to continue indefinitely the administrative authority of the Federal Radio Commission, it having been passed by the House in the form adopted by the Senate. Under existing law the commission would have relinquished this authority on December 31 to the Department of Commerce and itself would have become a radio appeal board, on a per diem basis.

The measure was enacted with the understanding that the commission would serve as the radio licensing authority until succeeded by a permanent agency on communications. There is pending before the Senate committee on interstate commerce, the Couzens bill (S. 6) to create a federal communications commission with complete authority over wires and wireless, and to take over such functions relating to these modes of communication as are now vested in the Interstate Commerce Commission, Department of State and other federal agencies.

The radio commission, since it was created in March, 1927, has been a temporary agency. Its life twice has been extended on a year-to-year basis.

The new legislation, besides indefinitely extending the commission, also provides for the appointment of a chief engineer with a salary of $10,000 per annum and two assistants with salaries of $7,500 per annum. The terms of the five incumbent commissioners expire on February 23.

Communications Deserve Place in Cabinet

General Harbord, President of Radio Corp. of America, Gives Statement of Views on Radio Communications to Senate Committee—Legislation Urged to Authorize Unified Service of Radio, Wires and Cable—Gives Radio Policies

As conceived and organized in October, 1919, RCA was a communications company. The great commerce in the entertainment field had then no existence. During the corporation's first year, 1920, radio in the entertainment field was the plaything of amateur operators. In that year RCA's sales amounted to $500,000. During the next year broadcasting had small beginning and sales were $1,500,000.

In the seven years I have served the corporation its sales of radio apparatus have mounted from $11,000,000 in 1922 to $87,000,000 in 1928. Not radiotelegraph devices but broadcast devices have brought about this vast increase.

Radiotelegraphy, its field as originally conceived, has been responsible for a fraction over 9 per cent, whereas merchandising radio receiving sets, the field newly developed since RCA was created, has been responsible for over 86 per cent of the corporation's total revenues from its organization up to June 30, 1929.

The corporation has not stood still in its original field, the highly competitive and stable field of international public telegraphy.

In 1922 it was operating eight international circuits directly serving six countries; it now operates 43 circuits directly serving 32 countries. In 1922 it handled 22,000,000 paid words in international telegraphy; in 1928, 47,000,000.

Spark sets, originally used in radio, became obsolete when alternators came into use; now alternators are giving way to short wave tube transmitters. Obsolescence more than use deprives radio devices of their value and, in radio, earnings must quickly return capital investments if they are to be returned at all.

To most countries where radio has gone its advent has reduced the rates. Radio brought the first reductions international telegraph rates knew in more than 30 years. And it has paid its own way, not at the expense of older services but by developing new reservoirs of traffic. Records show that where radio has gone, neither the gross nor the net revenues of the cables have declined.

Many Devices Developed.

Modern radio receiving sets, modern broadcast transmitters, international radio circuits directly connecting the United States with 32 foreign countries, effective communication with and between ships on the high seas, the highest class of talking machines with and without motion pictures, and more besides have been made possible through the patent unification so often denounced.

Under patents it acquired and developed at vast expense, the Radio corporation has elected to license many radio manufacturers, insisting always that an apparent ability to serve well the public should be a condition to the granting of a license. License fees are but the reasonable contribution of those who pay them to those whose efforts and money brought about the development and the purchase of the inventions, joint use of which must be made in the manufacture of modern radio devices.

RCA's licensees have prospered. In 1927 their sales amounted to $46,000,000, in 1928 to $128,000,000, and during the first half of 1929 to $64,000,000. Some whose voices once were loudest in the chorus of denunciation have since become licensees, and their denunciation ceased with their licensing. Some remain but the goal they seek is not the remedy for which they ask you, but licenses under the very patents they decry.

Let this patent unification be at an end tomorrow—let each organization use only the radio patents it actually owns; let licenensees operate only under their own inventions, and not use those licensed to them by others, and on that day will topple the whole structure of service which radio is rendering for the benefit and the entertainment of the American public.

Accord in Purpose of Bill.

The Radio Corp. of America has attained leadership in its field. Its organization was inspired by patriotism; its position has been won by courage, energy and skill added to the patriotism which was its original inspiration. In the years I have served it I have had no reason to doubt that from the date of its organization it has steadily rendered an increasing public service to our people, to our commerce and to the betterment of our relations with other countries. The American people have rewarded that service.

With the main purpose of the bill you have under consideration—the regulation of communications, cables, wire lines and radio—I am entirely in accord.

My company recognizes and accepts its responsibility as a public utility in the communications field. It regards its own regulation as in the public interest with respect to the facilities which it has devoted to public service and as a natural consequence of that responsibility.

Perhaps the most important advance contained in the present bill, as compared with previous legislation on this subject, is the proposal to place all communications facilities under a single regulating authority. Broadly speaking, I am in favor of this principle.

It should be remembered, however, that the communications industry and radio in particular are at present in a formative stage. There are some problems relatively pressing which demand the closest possible attention, while there are other matters which might reasonably be postponed with the expectation that the regulating body will make recommendations when it is clear that further legislative action is desirable.

Broader Field Might Impair Ability.

To give the regulating body too broad a field at this time might impair its ability to deal with those problems which are most pressing and important and thus might tend to injure the progress of radio communication and to defeat the very purpose of the act. Furthermore, serious complications might result from attempting to confer upon the regulatory agency authority in a field wherein its power is subject to inherent limitations.

In international communications the two ends of radio circuits are almost never owned and operated by the same entity. In more countries than the United States, alien ownership and control of radio stations are forbidden by law.

The country in which one terminus of a radio circuit is located has exactly the same sovereign jurisdiction over its operation as has the country in which the other terminus is located. Therefore, rates must be fixed, operating practices standardized, records kept and accounts rendered by agreement between the countries in which the termini are located or between the agencies owning and operating them.

The United States has already recognized the latter alternative in these management matters. When the International Radio Telegraph Conference met in Washington in 1927 the United States announced that in its considered opinion matters of management should be left to the operating agencies concerned; that it would not be a party to international agreements relating to matters of management including rates and operating practices, and that if other governments desired to make any such agreements they should be placed in a supplement which the United States would not be able to accept or to sign.

This policy was adhered to and in consequence the supplementary regulations adopted at the International Radio Telegraph Conference, Washington, 1927, were not signed and were not accepted by the United States, although the convention it-

self and the general regulations were accepted and signed.

It would seem, therefore, to be both in keeping with the announced policy of our government and with the peculiar characteristics of international radio communications, if in the field of international communications your legislation would permit and require matters of management, including rates, routes, classifications and operating practices, to be settled by agreement between the operating agencies, except insofar as the government itself may assume control over them through international conventions or arrangements heretofore or hereafter made with other governments.

Radio differs from other forms of communication—and from other industries as well—in the fact that nature has limited the number of channels by which radio communication can be carried on. Experts may differ as to the exact number, but everyone agrees that the number can not, by any possibility, be sufficient to satisfy the demands of this country—much less the demands of the entire world.

Whatever else we may do, we must avoid wasteful use of radio channels, and we must see that America obtains her share before they are all preempted by other countries.

At the present moment there is a race among the nations as to which can plant its flag first upon these radio channels by actual appropriation and use. Insistence in the United States that the all-too-few channels available be divided among many agencies has resulted in a state of indecision which has hampered American interests in this race.

We must always be in position to act promptly and with energy, or we shall lose opportunities that will never come again. Moreover, the division of the available channels among many agencies in America has resulted in no one of them obtaining the facilities necessary for the comprehensive telegraph service necessary in the public interest.

Not in Defiance of Law.

For these reasons, and other reasons, I hope that section 17 of the present radio act, prohibiting a radio organization from acquiring a wire line or cable organization, or vice versa, will not be carried into the bill now under consideration.

My own belief is that cable and radio facilities are naturally supplementary and that our communication system has now reached a point in its development where the coordinated use of facilities of all kinds should not only be permitted, but encouraged. I hope that the reexamination of the subject which you are now making will lead you to the conclusion that this prohibitory section is no longer desirable in the public interest.

I assume that one of the matters which your committee would like to have discussed in this connection is the possible acquisition by the International Telephone & Telegraph Co. of the communication services of the Radio Corp. of America. The proposals made have not been made in definance of law, but, in deference to the law; they are entirely tentative, and no agreement has been signed, or even written.

The facilities of the two organizations are supplementary in relation to each other. Their unification would make possible a service superior to that which either can offer at present. It would allow the land wire systems of the International company to supplement our radio services, and to supply them the domestic outlets they have long needed and still lack.

In certain important fields it would make possible the operation of alternative routes, assuring the public protection from interference and delay in time of war and in time of peace. It would permit the greatest economy in radio channels. It would make possible the prompt and decisive expansion of our facilities abroad. It would help us in the struggle to extend American enterprise, American communications and American trade into every country in the world.

Combination in Many Countries.

Such combination exists in practically every important country in the world today, except in the United States. This proposed acquisition would enable American communications to present a united front against like combinations in foreign countries—just as American industrial enterprises are enabled to meet forcign combinations on equal terms by combinations under the Webb act.

It would permit great economy in operating expense, and in the cost of management and overhead. It would avoid useless and enormously expensive duplications of circuits and plant investments.

I believe that a combination of wire and radio facilities would result in greatly broadening and accelerating the evolution of our American communications system. For the solution of many pending radio problems we need to combine the best thought of all the investigators and all the laboratories. We need the whole-hearted cooperation of scientific men and business men—working without jealousy or mental reservation—for the creation of many new things we need and expect, but which do not yet exist.

There are situations in which the principle of competition should, in the public interest, give way to the principle of superior public service. In the case of certain public utilities--the telephone for example, or the express companies, or the gas companies—we have learned that the public is not better served by many parallel and competing systems.

All the principles applicable to them are equally so to radio, with the added one, that the very scarcity of available facilities prevents maintenance of many parallel and competing radio systems. It makes no difference who owns public utility systems, so long as the public is well and faithfully served.

We believe that the field of communications is such a field, and that radio and cables can be utilized to best advantage if unified in operation, as they are almost universally abroad, and that while Congress is considering the matter of communications generally the unification of such services should be permitted.

The governments which constitute the British commonwealth of nations, after long study, authorized and brought about a consolidation of their cables and radiotelegraph service. In the news release which the imperial conference issued, their problem and the solution they proposed was thus tersely stated:

"Today Paris has become the nerve center of the world and the American cables and wireless telegraph and telephone systems now hold the premier place in the world and are rapidly outdistancing the British empire.

How could the problems be solved? By placing in commercial hands the whole of the extensive telegraph and telephone service of the United Kingdom; and by combination of the existing wireless and cable organizations as a public utility company. . . .

And behind it the public utility company should have the active support of the imperial governments in extending British influence in the field of world communications."

Might not a like policy well serve the United States, at least to the extent necessary to permit one of its radio organizations and one of its wire and cable organizations to unite, and thereby to offer to the people of the country a comprehensive communications service which neither could possibly offer standing alone?

Ohio and Iowa 1930 Convention Dates Announced.

The state telephone associations of Iowa and Ohio recently announced the dates for holding their respective conventions during 1930. The Iowa Independent Telephone Association will hold its meeting at the Fort Des Moines Hotel, Des Moines, April 8, 9 and 10. The Ohio Independent Telephone Association, Secretary-Treasurer Frank L. McKinney advises, will meet at the Hotel Deshler-Wallick, Columbus, on April 15, 16 and 17.

Severe Storms Damaged Indiana Telephone Companies' Lines.

Heavy sleet and snow December 19 and 20 which swept Indiana did thousands of dollars in damage to the telephone companies of the state. Service in some localities was entirely interrupted, but generally speaking, long distance lines were kept in service. It will be some time before service is wholly restored.

Presentations of the Ohio Honor Awards

Honor Awards of Ohio Independent Telephone Association Presented to Companies by Association Officials When Possible—Occasion Made Public Function by Some Companies—Reaction to Award Beyond Association's Anticipation

Since the publication in TELEPHONY of October 17 of the article descriptive of the honor awards of the Ohio Independent Telephone Association to companies showing progressive development and making substantial contributions to the industry and the public, the presentation of the awards have been made.

It was the original intention that the awards would be presented by President J. W. Safford and Secretary Frank L. McKinney of the association to the manager and some other officials of the companies honored, but it was found impossible to carry out this program. Other association business interferred with these officers getting away at appointed times to make the trips to the various places; and then at many points the company officials felt it necessary to arrange special luncheons and dinners that included the mayors and other city officials, civic dignitaries, members of the press, company directors, department heads, employes, etc.

Wherever this happened, the presentation became a public function. Addresses were made by President Safford and Secretary McKinney in which the reasons for the presentation were outlined and appreciations were voiced by members of the local telephone directorate and of the operating organization, in which they thanked the association for its award and said nice things about the way in which the association has functioned. The public officials and representatives of the press also had opportunity to express themselves.

President J. Warren Safford of the Ohio Association Presented Some of the Honor Awards to Company Officials at Public Functions.

Mayors and other political officials are ordinarily rather reticent upon the subject of utility companies, but at these gatherings they paid the highest possible tributes to the telephone companies and their employes.

It is undoubtedly true that these companies honored by the Ohio association comprise a select list that have recorded exceptional progress; but it is also true that in practically all cases the members of the local public have accepted their service in a matter-of-fact way and without any special recognition.

When reminded by reason of the award of the unusual character of the accomplishments of their local company, they have been very quick to respond. Hundreds and hundreds of the customers of these companies have troubled themselves to visit the telephone offices and congratulate officials upon the award, expressing satisfaction that their community was among those to be selected for special recognition.

As previously stated it was impossible for President Safford and Secretary McKinney, by reason of the necessity of looking after other association business to make all the presentations in person. So in those cases the presentation was made by some one familiar with the particular company's history, and despite the absence of the association officers, the presentation in some cases was made an event that will be long remembered by company officials, employes and public officials.

The reaction to the establishment of this award from companies, newspapers, public and officials has simply been wonderful and far beyond anything anticipated by the officials and directors of the Ohio Independent Telephone Association at the time it was instituted.

"I am quite sure," said Secretary McKinney in commenting upon it, "that nothing has ever been developed by any state association that so centered public attention and appreciation upon these operating companies as has this honor award.

"The Ohio association is very glad that it established this award, and that its acceptance by membership and public as a reward for merit and an incentive to future progress, has been so quick and enthusiastic. It has served to strengthen general association interest, already very keen, and to bring about a self-analysis upon the part of many companies that cannot prove other than helpful to the industry as time goes on."

Future awards will be made by the association in years to come, by the most careful selection of deserving companies from the list of those showing exceptional progressive development in the telephone art and making substantial contributions to the industry and the public.

Secretary-Treasurer Frank L. McKinney With President Safford Attended the Presentation of the Ohio Honor Awards at as Many Points as Other Association Business Permitted.

American Standards Association Joins International Organization.

Announcement that the American Standards Association has become a member body of the International Standards Association was made on December 18 by William J. Serrill, president of A. S. A.

As a result of this action, all of the national standardizing bodies except those of Great Britain, Canada and Australia are members of the International association. The countries now represented, in addition to the United States, are: Austria, Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Holland, Hungary, Italy, Japan, Norway, Poland, Roumania, Russia, Sweden and Switzerland.

Announcement was also made at the meeting of the re-election of Mr. Serrill as president and Cloyd M. Chapman as vice-president for the year 1930.

n Service—An Excellent e of Additional Income

nophones provide telephone companies with effective sales r additional extension business. It is surprising how many hese attractive instruments for extension service in upstairs when they see the different colors in which they can now be had. ate shades of orchid, pale green, and ivory, as well as deep red, he Monophone in color is a smart artistic addition to any room.

ticularly pleased with the mahogany and walnut Monophones, s either in gold or chromium. These are ideal for extension y or den at home, or for inner rooms in the office downtown. ggressive telephone organizations everywhere are actively going usiness, using a modern sales appeal based on the Monophone's attractiveness—and, what is more important, *are getting it.* l bring you color circulars on the Monophone to help you get s business.

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UTOMATIC

STEMS

When writing to Automatic Electric Inc., please mention TELEPHONY.

Laws of Potential Drop in Conductors

The Total Weight of Copper and Permissible Potential Drop in an Automatic Exchange Power Circuit—Formulae Evolved With Actual Example of Application to Automatic Exchange Design—Appendix, Extension of Formulae

By A. Prado,

Engineering Sales Department, Automatic Telephone Mfg. Co., Ltd., Liverpool, England.

Appendix A—Extension of Ring-Main Circuit Formulae.

(a) THE MULTI-RING-MAIN.

Let us consider the circuit shown in Fig. 7. The total weight of copper in circuit for non-uniform sections is:

$$W'' = \frac{12k\Theta I^2 l}{x} + \frac{12k\Theta P_1^2}{V-x} + \frac{12k\Theta P_2^2}{V-x} + \ldots\ldots + \frac{12k\Theta P_n^2}{V-x}$$

or $W'' =$

$$12k\Theta\left(\frac{I^2 l}{x} + \frac{P_1^2 + P_2^2 + \ldots\ldots + P_n^2}{V-x}\right) \quad \ldots\ldots\ldots (68)$$

By a similar mathematical treatment, we deduce,

$$x = \frac{V}{1+\sqrt{\dfrac{P_1^2 + P_2^2 + \ldots\ldots + P_n^2}{I^2 l}}} \quad (69)$$

and

$$x_T = \frac{V}{1+\sqrt{\dfrac{I^2 l}{P_1^2 + P_2^2 + \ldots\ldots + P_n^2}}} \quad (70)$$

Corollary: In the case of the circuit shown in Fig. 7-A,

$$P_2^2 = 0,\ P_3^2 = 0,\ \ldots\ldots\ P_n^2 = 0$$

Hence, we have $x = \dfrac{V}{1+\sqrt{\dfrac{P_1^2}{I^2 l}}} \quad \ldots (71)$

which can be simplified to

$$x = \frac{V}{1+\dfrac{1}{\sqrt{I}}\dfrac{P_1}{l}} \quad \ldots\ldots\ldots\ldots\ldots (72)$$

Also $x_T = \dfrac{V}{1+\sqrt{I}\dfrac{l}{P_1}} \quad \ldots\ldots\ldots\ldots (73)$

If the sections are uniform, then referring to Fig. 7, total weight of copper,

$$W''' = \frac{12k\Theta I^2 l}{x} + \frac{12k\Theta Q_1 L_1}{V-x} + \frac{12k\Theta Q_2 L_2}{V-x} + \ldots\ldots + \frac{12k\Theta Q_n L_n}{V-x}$$

or $W''' =$

$$12k\Theta\left(\frac{I^2 l}{x} + \frac{Q_1 L_1 + Q_2 L_2 + \ldots\ldots + Q_n L_n}{V-x}\right) \quad \ldots\ldots\ldots (74)$$

$$x = \frac{V}{1+\sqrt{\dfrac{Q_1 L_1 + Q_2 L_2 + \ldots\ldots + Q_n L_n}{I^2 l}}} \quad (75)$$

and $x_T =$

$$\frac{V}{1+\sqrt{\dfrac{I^2 l}{Q_1 L_1 + Q_2 L_2 + \ldots\ldots + Q_n L_n}}} \quad (76)$$

Corollary: If we consider the circuit shown in Fig. 7-A,

$$Q_2 L_2 = 0 \ldots\ldots Q_n L_n = 0$$

Hence we have $x = \dfrac{V}{1+\sqrt{\dfrac{Q_1 L_1}{I^2 l}}} \quad \ldots (77)$

and $x_T = \dfrac{V}{1+\sqrt{\dfrac{I^2 l}{Q_1 L_1}}} \quad \ldots\ldots\ldots\ldots (78)$

(b) RING-MAIN WITH MULTI-FEED CIRCUIT.

Up to the moment, we have been dealing with the problem of a ring-main having a single feed circuit. We shall now consider a ring-main with a "multi-feed circuit." The scheme is shown in Fig. 8. This type of circuit will arise in the case where several generators are floated in parallel across a battery.

Referring to Fig. 8, let,

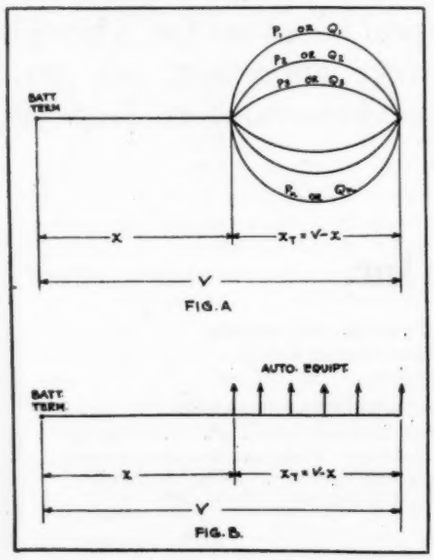

Fig. 7. Circuits Illustrating Extension of Formulae to the Multi-Ring Main.

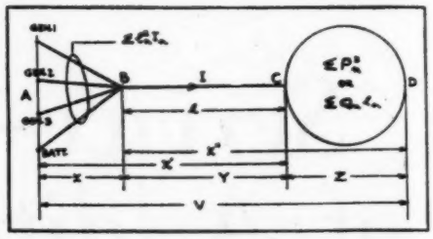

Fig. 8. Illustration of Ring Main with Multi-Feed Circuit.

$\Sigma I_n^2 l_n$ denote sum of $I^2 l$ factors between A and B;

ΣP_n^2 denote sum of P^2 factors between C and D;

$\Sigma Q_n L_n$ denote sum of $Q_n L_n$ factors between C and D.

(1) Non-uniform Sections.

If $x' = x + Y$, then

$$Y = \frac{x'}{1+\sqrt{\dfrac{\Sigma I_n^2 l_n}{I^2 l}}} \quad \ldots\ldots\ldots\ldots\ldots (79)$$

Writing $S = \sqrt{\dfrac{\Sigma I_n^2 l_n}{I^2 l}}$

we have $Y = \dfrac{x'}{S+1} \quad \ldots\ldots\ldots\ldots\ldots (80)$

Again,

$$x = x' - Y = x' - \frac{x'}{S+1} = x'\frac{S}{S+1} \quad (81)$$

Dividing (81) by (80), we have,

$$\frac{x}{Y} = \frac{x'\dfrac{S}{S+1}}{\dfrac{x'}{S+1}} = S$$

$$\therefore x = YS \quad \ldots\ldots\ldots\ldots\ldots\ldots (82)$$

Also if $x'' = Y + Z$,

then $Y = \dfrac{x''}{1+\sqrt{\dfrac{\Sigma P_n^2}{I^2 l}}} \quad \ldots\ldots\ldots (83)$

Writing $T = \sqrt{\dfrac{\Sigma P_n^2}{I^2 l}}$

we have $Y = \dfrac{x''}{T+1} \quad \ldots\ldots\ldots\ldots\ldots (84)$

Again,

$$Z = x'' - Y = x'' - \frac{x''}{T+1} = x''\frac{T}{T+1} \quad (85)$$

Dividing (84) by (85), we have,

$$\frac{Y}{Z}=\frac{\frac{x''}{T+1}}{\frac{x''}{T+1}}=\frac{1}{T}$$

$$\therefore\ Y=Z/T \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (86)$$

Substituting (86) in (82) we have,

$$x=Z\times S/T \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (87)$$

Now $V=x+Y+Z$ $\ldots\ldots\ldots\ldots\ldots\ldots (88)$

Substituting (86) and (87) in (88), we have,

$$V=Z\frac{S}{T}+Z\frac{1}{T}+Z \quad \ldots\ldots\ldots\ldots\ldots\ldots (89)$$

$$\therefore\ Z=\frac{VT}{S+T+1} \quad \ldots\ldots\ldots\ldots\ldots\ldots (90)$$

Knowing Z, we can determine the value of Y by formula (86), and having determined Y we calculate x for formula (82).

(2) Uniform Sections.

The method of calculating x, Y and Z is identical to the method given for non-uniform sections, except that in determining T, $\Sigma Q_n L_n$ should be substituted in place of ΣP^2_n.

$$\text{Thus } T=\sqrt{\frac{\Sigma Q_n L_n}{I^2 I}}$$

Example: The following example which gives an illustration of the application of the foregoing formulae in practice is taken from calculations actually applied to a 6,500-line automatic exchange abroad.

The power plant for the exchange in question comprises a battery of 26 cells having a capacity of 1,428 ampere hours at the 10-hour rate, three full telephone type motor-generator sets having each an output of 150 amperes at 50 volts, and a fourth motor-generator set also of the full telephone type, having an output of 50 amperes at 50 volts.

The exchange load is taken from the motor-generator sets while the battery is floated across 23 cells, the three remaining end cells being kept out of circuit. The function of the three end cells is to provide additional voltage in the event the motor generator sets should all be out of commission, thus necessitating the load being taken direct from the battery.

The various conductor loop lengths and current distribution are shown in Fig. 9.

Proceeding with the calculation of the voltage drops and conductor sectional areas, we have:

Value of the voltage drop Z; we determine Z by formula (90):

$$\text{where } S=\sqrt{\frac{\Sigma l_n^2 I_n}{I^2 I}}$$

$$T=\sqrt{\frac{Q_1L_1+Q_2L_2+\ \ldots\ldots\ +Q_nL_n}{I^2 I}}$$

Calculating S we have,

$$\begin{aligned} 24^2\times 150 &= 86{,}400\\ 30^2\times 150 &= 135{,}000\\ 42^2\times 150 &= 264{,}600\\ 38^2\times\ 50 &= 72{,}200\\ 70^2\times 288 &= 1{,}411{,}200\\ \therefore\ \Sigma\, l_n^2 I_n &= 1{,}969{,}400 \end{aligned}$$

and $I^2 I = 100^2\times 288 = 2{,}880{,}000.$

$$\text{Hence } S=\sqrt{\frac{1{,}969{,}400}{2{,}880{,}000}}=0.827$$

Calculating T, we have here

$Q_2L_2=0$ ..... $Q_nL_n=0$;

$Q_1=17{,}211$ (sum of LI factors between C and D);

$L_1=129.9$ feet;

$Q_1L_1=17{,}211\times 129.9=2{,}240{,}000$;

$I^2 I=2{,}880{,}000$;

$$\text{Hence } T=\sqrt{\frac{2{,}240{,}000}{2{,}880{,}000}}=0.882$$

$$Z=\frac{VT}{S+T+1}$$

Voltage drop in power board switchgear, etc., is 0.3. Hence available voltage drop, V, for calculating conductor sections $=1-0.3=0.7$,

$$\therefore\ Z=\frac{0.7\times 0.882}{0.827+0.882+1}=0.228 \text{ volt.}$$

Value of the voltage drop, Y; we calculate Y by formula (86). Hence $Y=Z/T=0.228/0.882=0.259$ volt.

Value of voltage drop, x; we calculate x by formula (82). Hence $x=SY=0.827\times 0.259=0.214$ volt.

Conductor Sectional Areas:

Motor-generator 1 to power board, area
$$=\frac{.00000831\times 24\times 150}{0.214}=0.14 \text{ sq. in.}$$

Motor-generator 2 to power board, area
$$=\frac{.00000831\times 30\times 150}{0.214}=0.175 \text{ sq. in.}$$

Motor-generator 3 to power board, area
$$=\frac{.00000831\times 42\times 150}{0.214}=0.244 \text{ sq. in.}$$

Motor-generator 4 to power board, area
$$=\frac{.00000831\times 38\times 50}{0.214}=0.0737 \text{ sq. in.}$$

Battery to power board, area
$$=\frac{.00000831\times 70\times 288}{0.214}=0.782 \text{ sq. in.}$$

Power board to distribution point, area
$$=\frac{.00000831\times 100\times 288}{0.259}=0.925 \text{ sq. in.}$$

Distribution bus bar, area
$$=\frac{.00000831\times 17{,}211}{0.228}=0.627 \text{ sq. in.}$$

Having determined the various conductor sectional areas, our next step is to find the nearest standard size to these. Though it is usual to fit in an equal or nearest larger standard size for a calculated sectional area, it does not follow that we should adhere strictly to this rule for every one of the foregoing sections. By fitting the nearest larger size conductor in a certain portion of a circuit, the value of the potential drop in that particular portion becomes less than that corresponding to the calcu-

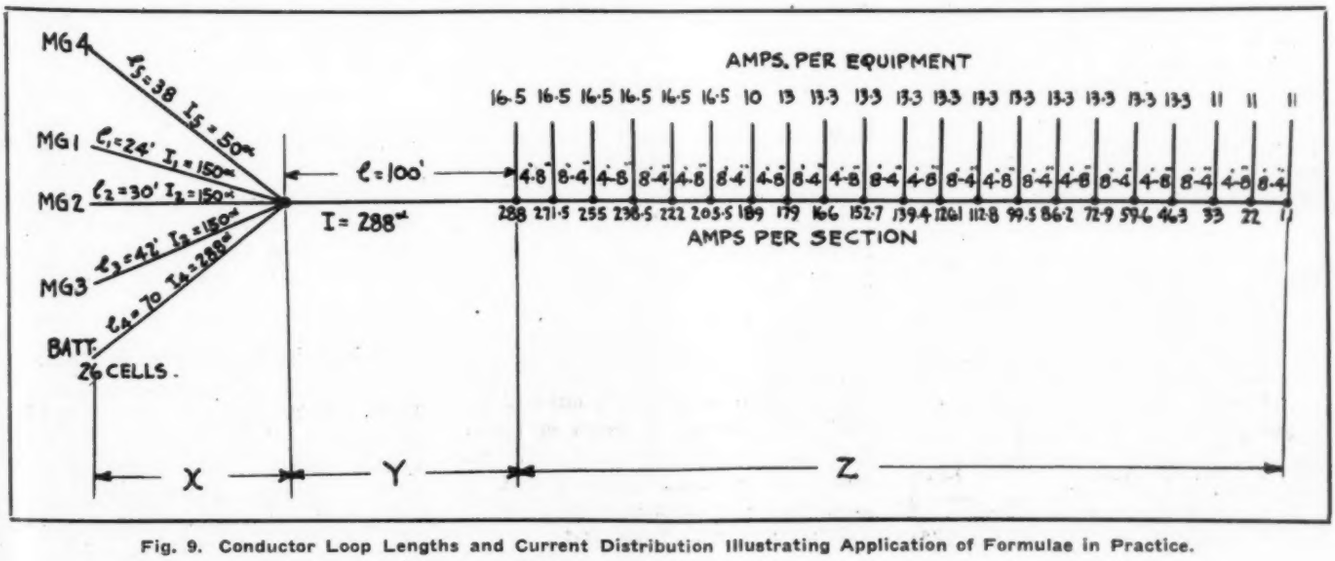

Fig. 9. Conductor Loop Lengths and Current Distribution Illustrating Application of Formulae in Practice.

lated sectional area. Consequently, it enables us to increase the potential drop in some other portion of the circuit, thus making it possible for a smaller conductor to be fitted.

This is, in fact, what we are going to do, and the best arrangement appears to be for us to fit a positive and negative conductor having one square inch sectional area (2 in. by ½ in. copper bar) between the power board and the distribution point.

The potential drop corresponding to this sectional area is:

$$\frac{0.00000831 \times 100 \times 228}{1} = 0.239 \text{ volt}$$

which is 0.02 volt less than the calculated potential drop.

If we consider the distribution bus bar, the nearest *lower* standard size to 0.627 square inch is 0.625 (2 in. by 5/16 in. copper bar) and the potential drop corresponding to this is

$(0.00000831 \times 17211)/0.625 = 0.229$ volt, which is 0.001 volt greater than the calculated potential drop.

We can afford to increase the potential drop in this portion of the circuit by 0.001 since we have 0.02 in hand. The total potential drop from the power board to the end of the distribution bus bar is $0.229 + 0.239 = 0.468$ volt. Hence, we can now calculate the sectional area of the conductors in the battery and motor-generator sets circuit, with a potential drop of $0.7 - 0.468 = 0.232$ volt. Thus we have:

	Sectional Area.	Nearest Size and Type of Conductor.
Motor-generator 1 to power board	$\frac{0.00000831 \times 24 \times 150}{0.232} = 0.129$	sq. in. 37/.072" VIRLC.
Motor-generator 2 to power board	$\frac{0.00000831 \times 30 \times 150}{0.232} = 0.161$	sq. in. 37/.083" VIRLC.
Motor-generator 3 to power board	$\frac{0.00000831 \times 42 \times 150}{0.232} = 0.2255$	sq. in. 37/.093" VIRLC.
Motor-generator 4 to power board	$\frac{0.00000831 \times 38 \times 50}{0.232} = 0.068$	sq. in. 19/.072" VIRLC.
Battery to power board	$= \frac{0.00000831 \times 70 \times 288}{0.232} = 0.722$	sq. in. 2"x⅜" copper bar

(c) Duplicate Batteries.

The exchange with duplicate batteries is a special case of the "Multi-Feed Circuit," in which one battery is a standby to the other. The calculation of the voltage drop in the various circuits, taking into account the second battery circuit from the power board, can be calculated by formulae (82), (86) and (90).

(*Concluded.*)

Nearly Two Million Daily Calls on Brokers' Private Wires.

Stock exchange expansion, both as to facilities and public participation as shown by public interest, has been wider in the last 12 months than in any similar period in the history of the New York Stock Exchange, according to the organization's Year Book, just published.

New records for increases in branch offices of member firms, for ticker installations, for visitors to the Exchange, for requests from the public for exchange literature and for cities in which exchange facilities have been established were all set up from October 1, 1928, to October 1, 1929, the period covered by the new publication prepared by the Exchange's committee of publicity.

Naturally the mechanical facilities of trading had to be enlarged, revised and expanded to cope with the additional trading volume. The Year Book says that at the opening of the 12 months a new quotation system for reporting bid and asked prices to member concerns was installed. Within five months the new system had been extended to every post on the floor, and to carry quotations from the various posts to the quotation room, where 69 girls operate the telephone switchboards and answer inquiries for quotations.

The average number of quotations given out daily since last February, when the new system was extended to cover all stocks, is 30,000. The high record was reached on October 4, when 42,114 quotations were given out. There are 315 wires from brokers' offices that run direct to the quotation switchboard and are used only for obtaining quotations.

Besides the quotation room switchboard there are three other telephone switchboards in the New York Stock Exchange building, carrying 187 trunk lines and 357 extensions and 12 tie lines and long distance connections. In addition, 1,921 private wires from brokerage houses run directly to the floor and 166 wires are handled through the automatic switchboard.

Approximately 1,800,000 calls are transmitted during each five-hour trading day on the private telephone wires from brokers' offices to the floor of the Exchange. These calls average 15 for each five minutes of the day on each of the 1,921 telephones. About 1,400 telephone clerks are on the floor to handle the orders contained in the calls.

Prices in the Metal Markets.

New York, December 23.—Copper—Quiet. Electrolytic spot and future, 18c. Iron—Quiet; No. 2 f. o. b. eastern Pennsylvania, $20.00@21.00; Buffalo, $17.00@18.00; Alabama, $13.00@14.00. Tin—Easy; spot and nearby, $39.37@39.50; futures, $40.00.

1930

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

The year 1929 is ending—1930 about to begin. Each one of us, no doubt, is pausing to look backward on our individual accomplishment during the year that is passing.

Whatever that backward glance tells us—whether it satisfies or disappoints us—we will keep to ourselves and face forward.

How many, many things we have to be thankful for. We keenly realize this when we read any daily newspaper.

I am thinking particularly tonight of the folks who had just as happy prospects as we had at daybreak of the New Year, 1929, yet who stand today with no desire to look backward and a dread of having to look forward because of their sorrow, remorse or horror of some deed committed for which they have sacrificed their honor, their freedom, and sometimes their right to go on living. When we think of them tasting the tang of their bitter cup, brewed by themselves, yes, let us feel a broad tolerance for them. Remembering, "To err is human; to forgive, divine." And also—"the human heart finds nowhere shelter but in human-kind."

And to those of us who have great hopes of the magic promise of achievement or dreams, as yet not fulfilled, may each day as it is unrolled from the scroll of the New Year, find us strong in our purpose to reach our goal.

Hearings on Federal Communications Bill

Formation of RCA Ascribed to President Wilson—Senator Wheeler Objects to "Political Propaganda"—Development of Radio Communications Only Begun—Facsimile Transmission to Revolutionize "Record" Transmission

Describing the Radio Protective Association, headed by Oswald F. Schuette, as "patent racketeers," Col. Manton Davis, vice-president and general attorney of the Radio Corp. of America, asked the Senate interstate commerce committee December 17 to investigate the organization and ascertain its motives.

Asks Charges Be Investigated.

Mr. Schuette, executive secretary of the association, has charged the RCA with monopoly in restraint of trade. He previously had testified before the committee, now holding hearings on the Couzens bill (S. 6) for the creation of a permanent commission on communications, that he represents a group of independent radio set and accessory manufacturers, who are combating the "radio trust."

"If the committee will examine Mr. Schuette, under oath, and compel him to disclose the name of each of those who have supported his activities and who are supporting them, together with the contributions made and being made by each, I think it will uncover one of those lobbies against which official Washington has so often inveighed," Col. Davis declared.

Col. Davis' charges and statement precipitated a discussion among committee members as to the propriety of particular activities of the RCA. The questions of property rights of licensed users of the ether, program censorship and radio communications generally were raised with Col. Davis on the witness stand. The committee also heard William A. Winterbottom, vice-president of RCA Communications, Inc., after which it took adjournment until January 7.

Following the hearing, the committee chairman, Senator Couzens, stated that Mr. Schuette would be given opportunity to answer the charges preferred by Col. Davis later.

"Advertising Bunk."

Col. Davis, in continuing his testimony on December 17, declared that the RCA was "inspired by an original suggestion of President Wilson, conveyed to Mr. Owen D. Young," and cited other "facts," which, he contended, showed that his company is not acting contrary to law.

Senator Wheeler, of Montana, interrupted the witness' testimony. "Just let us be fair about this thing," he said. "You have made the bald statement that the President of the United States, in a communication to Mr. Young, asked that the RCA be set up."

The Montana senator stated the only evidence previously given the committee was that President Wilson was interested in seeing that the Alexanderson alternator patent, a basic radio device, was not transferred to foreign hands.

"I think your statement is very unfair—that the RCA, generally looked upon as a trust, was initiated by the President of the United States. The idea that the RCA was set up at the request of the government is, in my judgment, the cheapest kind of advertising bunk; it should be stopped," Senator Wheeler said.

Asked whether he felt a broadcasting station is a public utility, Col. Davis replied in the affirmative, with the proviso, "If it is considered in the right end."

Broadcasting, he said, is like a theater, and if a theatrical manager permitted all who applied to perform there would be no theatrical audience.

"The radio audience can walk out on you faster than any audience in the world," Col. Davis said. "There is some embarrassment to leaving a theater, but there is no embarrassment in turning off a button on a radio set."

Col. Davis recommended that broadcasting programs be left as free from government supervision as theaters and newspapers. Like a theatrical producer, he continued, if the broadcaster does not give the audience what it wants he will "lose his shirt."

The question whether broadcasting stations should be liable to libel suits as are other public mediums also was discussed. Senator Wheeler said that "propaganda over the radio should be controlled."

"Those actively engaged in radio communications believe that the job is only just begun," said William A. Winterbottom, vice-president of RCA Communications, Inc., in discussing the future of radio communications on December 17.

Endorsing the purposes of the Couzens bill, he said that some of its features long since have been adopted by the international communication companies, and have been found "most helpful."

Under cross-examination by William C. Green, committee counsel, Mr. Winterbottom said that in the North Atlantic communication traffic there were no direct parallel circuits competitive with British circuits. Across the Pacific, he declared, there is parallel line competition.

Growth of Radio Communications.

Mr. Winterbottom said he felt confident there will be "a clash in China" between American and foreign communications interests, and also that it was most likely in South America.

In his statement to the committee, Mr. Winterbottom said:

"Ten years ago a handful of young men under my immediate supervision inaugurated our first commercial trans-Atlantic radio communication service. The United States and Great Britain were thus linked together by a new medium of communication. The initial services, inefficient when begun in 1920, were brought to a commercial standard in 1921, when receiving inventions found necessary to the art were acquired.

Other countries were added to the system as rapidly as equipment could be manufactured, and men were trained to carry on this type of public service. Today, RCA Communications, Inc., has trained and employs 1,100 men exclusively engaged in international communications, and has an annual pay roll of almost $2,000,000.

The leading nations of the world entered upon a race for supremacy in world radio communications. The race has been swift, and the official world radio map clearly indicates the great importance of this new communication facility. No foreign radio service compares in completeness with our own, but the recent merging of radio and cable systems abroad has created an entirely new situation, which, in my opinion, can only be countered by a similar reorganization of communications in our own country.

Trade Follows Communication.

"It has been said that trade follows the flag. Actually trade follows communication and transportation. No commerce laden vessel leaves port unless preceded by many exchanges of international communications. No foreign trade or commerce can be effectively stimulated and created when foreign communication systems are relied upon and foreign ships utilized to carry our export and import products. Our foreign transportation has been encouraged and developed. Our foreign communications should not be neglected.

Ten years ago the United States had direct communication by cable with relatively few countries. In Europe our cables touched Britain and France only. To reach any other country on the other side of the Atlantic our business communications necessarily paid financial tribute to Great Britain or France, and continued to their many destinations over foreign controlled telegraph lines.

Today in addition to some increased cable facilities, RCA has flung a vast direct network of communication channels all over the world to the 30 most important countries with which we conduct the bulk of our foreign trade.

New services to be opened during 1930 are: Russia, Czechoslovakia, Chile, northern China.

As in all pioneering efforts, many of these services are operated at a loss, but we have every confidence that direct communication will encourage the more rapid growth of foreign trade, and ultimately produce a profitable communication service.

Those actively engaged in radio communications believe that the job is only just begun. Something more rapid, more efficient, and less expensive must be produced.

Facsimile Transmission.

"You have been told something of facsimile transmission during the last few days. This new method promises some day to completely revolutionize the art of record communication. The RCA has spent over $1,000,000 on facsimile development, and must keep on spending, because the present stage of development promises so much for the future.

I have seen facsimile inventors in England, Germany and France all busily working on the solution of this one problem. It is another international race to commercially solve a great secret. We hope the honors will ultimately be awarded to American genius.

It may be interesting to learn that last month a facsimile service was inaugurated between Germany and Argentina using German apparatus.

Wave Lengths.

"May I now describe the wave length situation, not in technical language, for I am not an engineer, but as it has occurred to me during the last few years. Wave lengths 10 years ago were not numerous because radio engineers had not discovered how to make extensive use of them.

Every few years additional research has lengthened the spectrum of usable wave lengths, and at the same time transmitting stations were designed which stayed more or less fixed on the wave length or frequency assigned to them. The wave lengths now in use have been made available by scientific research the world over.

The channels resulting from this research, therefore, belong to the people of the world, and scientific research is continuing to make more wave lengths available and useful.

The radio engineer is producing more and more channels for the Federal Radio Commission and similar agencies of other governments to award in all fields of radio communication. The efforts of the radio engineers of the various organizations in increasing the number of available wave lengths have not more than kept pace with the needs of their organizations for new services.

American communication companies are highly efficient, and have been quite successful in competition with foreign communication companies. They have contributed by far the major technical advances in the art of communication—wire, cable and radio—during the past decade.

The great foreign communication companies have now acknowledged American supremacy and leadership. To offset our technical advantage the majority, during the past year, have entered combines or mergers, the better to combat our world progress.

You have already heard much about the British $500,000,000 cable and radio merger. It is a perfect monopoly. A representative of the Department of Commerce has already filed with your committee the details of the British merger. We now find that the postmaster general of Great Britain considers radio and cable services perfectly supplementary and quite suitable for international communication without consulting the wishes of the sender. . . .

And now may I quote from the circular issued upon the merger of the French cable and radio companies?

The merging of the two systems has resulted in a reduction of the transmitting time, and an increase in safety and accuracy. On the one hand, the most modern systems (directional short waves) permit a maximum speed unheard of so far. On the other hand, with the cables we have the advantage of supplementing the service in case of temporary inefficiency of the radio during short periods of atmospheric interference.

By means of the close combination of the two companies, the association of their technical facilities, the public is assured, when confining their traffic to the French route, that the choice of the two types of service will be made by an organization common to the two systems, and with the only thought in mind to assure the transmission of such traffic in the best possible way.

One may well wonder how American communication companies competing for business in France are likely to fare in the face of the French merger company's obvious new advantages.

The Italian merger took place some time ago, and the German merger will be completed early in 1930.

So we find that Great Britain, France, Italy and Germany have reached the same conclusions—that in international communications, private operation is preferable to government operation, and that competition between rival companies of the same nationality is no longer economically justifiable or technically desirable.

America's position in the field of international communication was never so strong as it is today. Our duty now is to keep it so.

Some questions have been asked about the ability of a communications commission to regulate the practices and tariffs of American communication companies engaged in international communications. These questions are but natural, for the United States is not yet a signatory to the international telegraph convention.

Ever since the first international telegraph convention was held in St. Petersburg between July 10 and July 2, 1875, the governments of the world controlling international communication systems have experienced no difficulties in regulating and adjusting international telegraph tariffs."

Hotel Men Urged to Unite to Obtain Larger Share of Tolls.

An attack upon the practices of the Bell telephone system in the division of long distance tolls with Independent lines and hotels was made in an address before a convention of hotel men of Missouri, Kansas and Oklahoma, held in Tulsa, Okla., December 2, by I. H. Nakdimen, banker, Independent telephone owner and Publisher of a number of small newspapers. He is president of the City National Bank of Fort Smith and is connected with the Oklahoma-Arkansas Telephone Co.

According to the St. Louis Post-Dispatch Mr. Nakdimen, in urging the hotel men to unite in an effort to obtain a larger share of the long distance tolls for business originating or completed on their premises, told how he had resorted to the courts trying to get greater compensation for the services rendered by his company in connection with long distance calls.

He said he had made a study of costs incurred by hotels in giving telephone service and that in the case of one hotel with 800 rooms he found the hotel received only $15,000 for telephone service that cost the hotel $26,000. He said the hotel paid $9 a year rent for a wall telephone instrument, the cost of which was about $7 or $8.

On all calls, local or long distance, coming into the hotel, he said, the hotel receives nothing, although the cost to it of this service is greater than on the outgoing calls. On the outgoing calls the hotel receives a commission.

He suggested that large users of the long distance telephone should install time clocks on their telephones or switchboards to give an accurate check of the time consumed by calls and to guard against errors that might be made by operators in listing charges.

He also complained that the Independent telephone companies have been unable to obtain what they consider a fair division of the tolls for calls which they handle for the Bell system.

Mr. Nakdimen charged that through stock ownership or business arrangements, the Bell system is able to control most of the Independent companies and keep them from taking any concerted action for their own protection.

As evidence of the highly profitable business of the Bell system he cited the large increase in capitalization of the American Telephone & Telegraph Co. in the last 20 years. The increase has been from about $200,000,000 to more than $1,300,000,000.

The Financial Side of Companies

Miscellaneous Items of Interest Regarding Financial Matters of Telephone Companies—New Securities Issued During Past Month—Figures From the Monthly Reports of Larger Companies to Interstate Commerce Commission

Gold Notes Issued as Part of Expansion Program.

The Western Power, Light & Telephone Co., of Salina, Kans., has authorized an issue of $2,000,000 of 6 per cent one-year gold notes as part of a program of expansion, adding several new properties to the present group of subsidiaries, which include telephone companies in Oklahoma and Missouri and an electric light plant in Kansas.

There are $4,737,000 first lien collateral 6 per cent gold bonds, series A; $2,300,000 preferred stock, 65,000 Class A and 100,000 common shares outstanding.

Preliminary earnings reported for the entire group for the 12 months ended September 30 shows gross revenues of $2,398,879 and net earnings of $959,869 before depreciation, federal taxes and bond interest.

Pacific T. & T. Co. Earnings Report Shows Increases.

Additional new business, both local and long distance, during the first ten months of 1929, brought an increase in gross earnings of the Pacific Telephone & Telegraph Co. system, according to a report recently issued.

The gross earnings for the ten months totaled $84,213,170. This is an increase of $8,602,508 over the corresponding ten months of 1928. The net earnings for the ten months' period were, respectively, $13,059,451, in 1929, compared with $12,293,226 in 1928.

For October the company's report showed gross earnings of $8,818,526, against $8,528,155 in September, 1929. The October net was $1,443,727, which compares with $1,238,189 in September.

September Earnings of Class A Companies Show Increase.

Compilations from reports of revenues and expenses of 98 telephone companies, as made to the Interstate Commerce Commission for the month of September, 1929, show gross operating revenues of $95,294,928, as compared with $86,560,002 for the corresponding month of 1928, showing an increase of 10.1 per cent. The operating income for the same months was $23,179,811 and $21,212,736, respectively, an increase of 9.3 per cent for 1929.

Operating revenues for the nine months ended with September, 1929, were $847,011,002, as compared with $768,725,518 for 1928, showing an increase of 10.2 per cent for this year. Operating expenses for the same period were $570,550,634 and $510,608,212, respectively, an increase of 11.7 per cent for 1929. The operating income amounted to $203,824,205 for this year's nine months' period, an increase of 7.5 per cent over 1928, when it was $189,530,980.

The companies, which include only those having annual operating revenues in excess of $250,000, had 16,571,581 stations in service at the end of September, 1929, an increase of 6.3 per cent over 1928, when there were 15,585,062. Complete data for the Central West Public Service Co., Omaha, Neb., and Southeast Missouri Telephone Co., Cape Girardeau, Mo., were not available for inclusion in this report.

A. T. & T. Convertibles to Provide Part of Requirements.

The conversion of the American Telephone & Telegraph Co. 4½ per cent gold debenture bonds, due in 1939, which will become effective on January 1, is expected in financial circles to provide part of the financial requirements of the company in the coming year. It is estimated that $175,000,000 new capital can be obtained in this manner and that the balance of the company's requirements will be met through an offering of rights to stockholders next summer.

Gross expenditures of the Bell system for new construction were $377,000,000 in 1927, $428,700,000 in 1928 and about $600,000,000 this year. They are estimated at $700,000,000 for 1930.

In 1927 there was no public financing, but capitalization was increased $37,325,356,

Items.	Month of September				Nine months ended with September			
	1929.	1928.	Increase or decrease (*). Amount.	Ratio, Pct.	1929.	1928.	Increase or decrease (*). Amount.	Ratio, Pct.
Number of company stations in service at end of month	16,571,581	15,585,062	986,519	6.3	.....	.....	.....	....
Revenues:								
Subscribers' station revenues	$56,443,691	$52,579,512	$3,864,179	7.3	$506,417,622	$471,408.636	$35,008,986	7.4
Public pay station revenues	3,626,005	3,434,517	191,488	5.6	34,421,793	32,461,025	1,960,768	6.0
Miscellaneous exchange service revenues	831.729	718,353	113,376	15.8	7,130,775	6.122,811	1,007,964	16.5
Message tolls	27,960,798	24,669,651	3,291,147	13.3	244,831,964	213,408.200	31,423,764	14.7
Miscellaneous toll line revenues	3,801.117	2,967,007	834,110	28.1	31,943.650	26.211,144	5,732,506	21.9
Sundry miscellaneous revenues	2,590,795	2,132,419	458,376	21.5	21,938,490	18,729,290	3,209,200	17.1
Licensee revenue—Cr.	1,245,684	1,513,548	*267.864	*17.7	10,964,573	13,263.862	*2,299,289	*17.3
Licensee revenue—Dr.	1,204,891	1,455,005	*250,114	*17.2	10,637,865	12,879,450	*2,241,585	*17.4
Telephone operating revenues	$95,294,928	$86,560,002	$8,734,926	10.1	$847,011,002	$768,725,518	$78,285,484	10.2
Expenses:								
Depreciation of plant and equipment	$14,981,603	$13,840.261	$1,141,342	8.2	$129,199,287	$120,187.368	$ 9,011,919	7.5
All other maintenance	15,101,899	13,431,549	1,670,350	12.4	139,127,582	118,066,331	21,061,251	17.8
Traffic expenses	19,897,957	18,565,091	1,332,866	7.2	177,170,715	165,144,935	12,025,780	7.3
Commercial expenses	8,889.727	7,820.968	1,068,759	13.7	79,079,959	68,296.058	10,783,901	15.8
General and miscellaneous expenses	5,131,830	4,324,126	807,704	18.7	45,973,091	38,913,520	7,059,571	18.1
Telephone operating expenses	$64,003,016	$57,981,995	$6,021,021	10.4	$570,550,634	$510,608,212	$59,942,422	11.7
Net telephone operating revenues	$31,291,912	$28,578,007	$2,713,905	9.5	$276,460,368	$258,117.306	$18,343,062	7.1
Other operating revenues	$ 3,368	$ 3,098	$ 270	....	$ 30,212	$ 29,540	$ 672	....
Other operating expenses	3,529	5,431	*1,902	....	32,657	52,382	*19.725	....
Uncollectible operating revenues	617,223	526,285	90,938	17.3	5,361,313	4,808,751	552,562	11.5
Operating income before deducting taxes	$30,674,528	$28,049,389	$2,625,139	9.4	$271,096,610	$253.285,713	$17,810 897	7.0
Taxes assignable to operations	7,494,717	6,836,653	658,064	9.6	67,272,405	63,754,733	3,517,672	5.5
Operating income	$23,179.811	$21,212,736	$1,967,075	9.3	$203,824,205	$189,530,980	$14,293,225	7.5
Ratio of expenses to revenues, per cent	67.16	66.98	.18	....	67.36	66.42	.94	....

Operating Statistics of 98 Class A Companies for September, Compiled from Reports to Interstate Commerce Commission.

largely through payments of instalments on previous financing. In 1928 the net rise in capital and funded debt was $250,927,992, including $186,275,800 more in parent company stock.

About $219,000,000 of the 4½ per cent bonds were sold, and with further instalments paid on the 1928 stock offering and direct financing by Bell system companies, such as the $32,000,000 issue of Southern Bell Telephone & Telegraph Co., it is estimated that total public financing will show an average of 50 per cent of gross construction expenses.

The 4½ per cent bonds are convertible for eight years beginning January 1; but where stock will be taken at $180 a share in 1930 for such conversions, the price will be $190 during 1931 and 1932 and $200 from 1933 to 1937 inclusive, showing a premium for converting the bonds next year. As the company allows the bondholder to take one share of stock for each $100 face value of bonds and to pay the difference of $80 in cash, the incentive to convert the bonds is expected to result in substantial cash receipts next year from conversions.

On this basis it is generally expected that when the stock offering is made, it will be probably at a lower ratio than in 1928, depending, of course, upon the action taken by bondholders with reference to their conversion privileges. That is because the company is not expected to seek as much as the foregoing amount through issuance of stock alone.

An estimate of the total financing by the Bell system in 1930 would be $350,000,000, judged by the past. One or more of the leading subsidiaries may finance on their own account, and the American Telephone & Telegraph Co. itself probably will seek only about $200,000,000 through an offering of stock. This compares with the $185,863,000 stock offering of 1928, a record for this or any other company. The stock offering may possibly run as high as $250,000,000.

The chief reason bondholders, who elect to convert their holdings, are expected to deposit $100 of bonds and $80 in cash for each share of stock lies in the greater profit from this method when the bonds are selling above par. At the closing price on December 23 of 134 for the bonds, it would be preferable to use the $100 of bonds and $80 in cash method. Should the bonds decline below $100, it would be best to take as many shares as may be obtained through dividing 180 into the total face value of bonds held, with adjustment of balances over or under that multiple.

Issue of 6 Per Cent Gold Notes of Salina, Kans., Company.

Western Power, Light & Telephone Co. recently announced for sale an issue of 6 per cent gold notes to the amount of $2,500,000, dated December 1, 1929, and due June 1, 1931. Halsey, Stuart & Co. and A. B. Leach & Co., Inc., of Chicago and New York, are marketing the issue.

The Western Power, Light & Telephone Co. owns and operates, through subsidiaries, public utility properties in Missouri, Kansas, Oklahoma and Texas, and ice properties in Kansas, Texas and New Mexico. Electric light and power, water, ice, gas or telephone service will be supplied in 172 communities. The company owns all outstanding capital stocks and funded debt of subsidiaries, except certain minority interests. The balance sheet at August 31, 1929, shows property value, less depreciation, of more than $11,000,000.

The combined gross revenue for 12 months ended August 31, 1929, is reported at $2,310,091.40 and net income, before interest, depreciation and federal tax, at $921,821.51. Annual interest requirement of the entire funded debt, including this issue of notes, is $434,220.

The notes are priced at 98.60 and interest, yielding 7 per cent.

Nebraska State Railway Commission Issue 1928 Report.

The belated printed report of the Nebraska State Railway Commission, recently issued, shows that during the year 1928 a total of 80 applications with respect to rates and service were filed by the telephone companies of the state, and of these, 67 were disposed of. Only eight formal complaints were filed against the companies during the 12 months, and but 29 that were informal covering trivial matters. Four inventories and appraisals were made by the commission engineering force.

The book contains the revised and final figures with respect to the operations of the companies. The total number of these companies is decreasing. During 1929, reporting for the previous year, a total of 154 companies of the higher classes and 33 for Class F reported. Of the 154 in the first five classes, only 83 paid dividends, 44 others made some money and 27 paid out more than they received. Only six of the 33 in class F, those having less than 200 stations, paid dividends.

Here are some of the more important totals taken from the book:

For the 152 companies: Book cost of property, $6,909,353 (including Northwestern Bell company and Lincoln company, $40,292,013); capital stock $2,100,000; other assets, $883,137; total liabilities, $7,792,491; including notes and bonds, $1,669,424, depreciation reserve, $1,819,879, and surplus and undivided profits, $1,431,111.

For the 152 companies: Operating reveues, $1,736,724; operating expenses, $1,311,587; taxes, $87,485; interest, $101,625; dividends paid, $124,247; undivided profits, $130,007, being net earnings of $255,000 on nearly $7,000,000 of property as a whole. Including the Northwestern Bell company and the Lincoln company the totals are: Operating revenues, $10,873,000; operating expenses, $7,572,728; taxes, $912,000.

The number of stockholders in these 154 companies is 18,530, five having more than a thousand each. The 152 companies serve 73,400 stations, divided as follows: Business, 10,437; city residence, 26,350; rural residence, 33,858. Figures for the Northwestern Bell company were not reported, but it is estimated that including the Class F companies, that serve a total of 2,662 stations, and the Lincoln company, the total is approximately 268,000. These 152 companies and the 33 in Class F switch a total of 13,335 for the rural farm lines.

The Class F group of 33 companies reports an income of $65,932 and disbursements of $61,431; capital stock of $45,498; dividends paid (by six companies), $2,806; number of stockholders, 847.

Stock Issued by Northwest Company of Madison, Wis.

The Northwest Telephone Co. last month offered for sale 3,300 shares of its cumulative preferred stock aggregating $330,000, according to an announcement from the general office of the company in Madison, Wis., by John S. Allen, president.

The stock pays dividends at the rate of 6 per cent and has $100 par value. Stockholders to this issue will receive four quarterly dividends of $1.50 per share, payable on the first days of January, April, July and October. The company reserves the right to redeem this stock at $105 per share upon 30 days' published notice.

Proceeds of the issue will be used for the extension and improvement of the facilities of the company and for the acquisition of those properties now operated under lease. When the proposed acquisitions of property are completed, the company will own 17 buildings and rent 7 buildings in cities where exchanges are operated. The company serves 7,500 subscribers.

The combined assets of the Northwest Telephone Co. and properties to be acquired as reported August 31, 1929, totaled 683,000. A net operating profit of $60,080 was shown for the year ending March 31, 1929. Based on previous operation the future profits available for preferred dividends are estimated to be more than twice the preferred stock dividend requirements.

Northwestern Bell's Nebraska Report on Nine Months' Operation.

The Northwestern Bell Telephone Co. has filed with the Nebraska State Railway Commission its report for its Nebraska operations for the first nine months of the year. This shows a gain of nearly $100,000 in exchange revenues over the same period in 1928 and of $155,000 on toll business. Exchange revenues for the

period named were $3,279,150; toll revenues, $1,375,860; and miscellaneous revenues, $205,426. The total revenues were $4,860,436, an increase for the nine months, as compared with the same period of the preceding year, of $288,161.

Operating expenses, however, ate up most of the increase, reaching a total of $3,770,296, an increase of $278,412. Traffic expenses were $1,001,481, an increase of $61,512; commercial, $379,494, increase, $30,558; general, $261,714, increase $48,478; maintenance, $798,251; increase, $108,137; depreciation, $779,016, decrease of $7,858; taxes, $455,167, increase, $3,981.

The gross revenue per station was $4,921 per month, compared with $4,762 last year; net, $1,109, as compared with $1,128.

Revenues to average plant in service, 29.01 per cent; expenses to average plant in service, 23.07 per cent; net earnings to average plant in service, 6.67 per cent, compared with 6.89 per cent for the same period in 1928. Telephone expenses to total revenues, 77.57 per cent, compared to 76.37 per cent. Net earnings to average capital and construction work in progress, 6.51 per cent, compared to 6.74 per cent. Commercial expenses to total revenues, 7.81 per cent.

The company has plant in service of a book cost of $22,296,000; fixed capital, $23,077,000. Stations operated by the company number 112,062, an increase of 2,021 for the period, while connecting stations number 186,552, a decrease of 43. The total number of stations is 298,614.

Associated Telephone Utilities Increases All Classes of Its Stocks.

At a special meeting of the stockholders of the Associated Telephone Utilities Co., Chicago, which was held on December 14, at the office of the corporation, 3018 Dupont Building, Wilmington, Del., it was decided to issue common stock in payment of dividends on any class of stock of the company.

In another amendment to the company's certificate of incorporation it was decided to increase the prior preferred stock from 100,000 to 150,000 shares, to increase the preferred stock from 50,000 to 150,000 shares, and increase the authorized common stock from 1,000,000 to 3,000,000 shares.

A. T. & T. to List More Stock on Stock Exchange.

The American Telephone & Telegraph Co. has applied to the New York Stock Exchange for the listing of 2,591,127 additional shares of common capital stock of $100 par value, of which $40,000,000 represents stock to be issued to employes of the Bell system from time to time and $219,112,700 represents the total amount of stock issuable in conversion of the 4½ per cent 10-year convertible bonds issued last year.

It was learned last week that the company has already begun to receive applications from bondholders desirous of effecting a conversion of their bonds into common stock as soon as the bonds become convertible, which will be January 2, 1930, the first business day of the new year.

The bondholders are being advised that it is to their advantage to deposit $80 in cash and $100 face value in bonds for every share of common stock desired under the conversion plan, and nearly all the early applicants have determined on this plan on their own initiative, it is said.

In banking circles it is reported that large blocks of bonds will be presented for conversion into stock on the basis described on January 2 next, based on the heavy arbitrating that has gone on in A. T. & T. stock and bonds over the last few months and on large known institutional holdings of the convertible issue.

Current Price Quotations on Listed Telephone Stocks.

	December 20		
	High.	Low.	Last.
American Telephone & Telegraph Co. (9)	217	210	212¾
Associated Telephone & Telegraph Co. (A)	60	59	60
Associated Telephone Utilities Co.	21½	21	21
Cincinnati & Suburban Bell Telephone Co.	112⅞	112⅞	112⅞
International Telephone & Telegraph Corp.	71⅞	64½	69
New York Telephone Co. pfd. (6½)	112⅝	112⅝	112⅝
Pacific Telephone & Telegraph Co.	152	152	152
Western Power, Light & Telephone	26½	26½	26½

OVER THE COUNTER QUOTATIONS.

	Dec. 20.		Dec. 19.
	Bid.	Asked.	Bid.
Associated Telephone & Telegraph Co., pf. (7)	103	105	103
Associated Telephone & Telegraph Co. (D), (4)	53½	55	53½
Associated Telephone Utilities Co., pf. (6)	80	88	....
Associated Telephone Utilities Co., pf. (7)	94	100	....
Bell Telephone Co. of Canada (8)	151	155	151
Bell Telephone Co. of Pennsylvania (6.50)	112	115	112
Cuban Telephone Co. (8)	135	....	135
Cuban Telephone Co., pf. (7)	102	....	102
Diversified Investments, Inc., pf. (7)	100	103	100
Lincoln Telephone & Telegraph Co. (8)	115	....	115
Mountain States Telephone & Telegraph Co. (8)	159	163	155
National Telephone & Telegraph Corp., pf. (7)	103	105	....
New England Telephone & Telegraph Co. (8)	146	150	146
Ohio Bell Telephone Co.	110	113	110
Peninsular Telephone Co., (7)	110	....	110
Peninsular Telephone Co., pf., A (7)	100	....	100
Porto Rico Telephone Co. (8)	85	....	85
Porto Rico Telephone Co., pf. (8)	100	....	100
Rochester Telephone Corp., 1st pf. (6.50)	102	....	102
Southern New England Telephone & Telegraph Co. (8)	168	176	168
Wisconsin Telephone Co., pf.	110	112	....

Middle Western Company Offers 6 Per Cent Gold Notes.

The Middle Western Telephone Co. recently announced the sale of convertible 6 per cent gold debentures to the amount of $500,000. The notes become due November 1, 1939, and are priced at 97 and accrued interest to yield 6.41 per cent. Kent, Grace & Co.; Emery, Peck & Rockwood Co. and Porter, Fox & Co. are marketing the issue.

The Middle Western company controls operating telephone systems in Wisconsin, Illinois and Ohio, the properties serving a population exceeding 340,000. The principal cities under franchise are La Crosse, Wis.; Park Ridge, Des Plaines, Pekin, Havana, Ill., and Warren, Wooster and Mt. Vernon, Ohio.

The company's gross earnings for the 12 months ending June 30, 1929, were in excess of $1,800,000. The balance available for interest on the funded debt was $410,600—equivalent to 5.90 times the annual charges. After deducting depreciation and estimated federal taxes the balance is equal to 3.40 times such requirement, it is stated.

The debentures are convertible into class A common stock of the company at varying rates up to November 1, 1934. This stock is listed on the Chicago stock exchange, pays $1.75 annually in dividends and participates in additional dividends equally with the class B common stock after that stock has received the same amount in any year.

International T. & T. Obtains Control of Company in Peru.

A controlling interest in the Peruvian Telephone Co. has been acquired by the International Telephone & Telegraph Corp. through the deposit of a large majority of the 40,000 outstanding shares of stock which have been deposited by the stockholders under an agreement of sale to the International. A price of $72 a share was offered, giving a value of $2,880,000 to the 40,000 outstanding shares.

The Peruvian Telephone Co. operates more than 65 per cent of the telephones in Peru, serving Lima and the other principal cities and supplying a comprehensive long distance telephone service. Under its concession from the Peruvian government it is empowered to extend its service into all parts of the country.

All the Latin American telephone companies are expected to be linked by radio telephone with one another and the United States and Europe before many months, as the International system and its affiliates now have concessions for wireless telephone and telegraph operation in Argentina, Chile, Brazil, Uruguay, Colombia, Peru, Ecuador and other countries.

Northwestern Bell Telephone Co. Plans Big Iowa Expansion.

The Northwestern Bell Telephone Co. plans expenditures of $6,000,000 for extending and improving its facilities in Iowa in 1930. This will be the largest construction program ever launched by the company in Iowa, it is stated.

With the Manufacturers and Jobbers

Stromberg-Carlson Celebrates Its Biggest Business Month.

More than 250 foremen, sub-foremen, department heads and officials of the Stromberg-Carlson Telephone Mfg. Co. recently celebrated the biggest business month in the company's history, which covers a period of more than 35 years, at a banquet in the plant dining room in Rochester, N. Y. This banner month was October.

Wesley M. Angle, vice-president and secretary, was toastmaster. Speeches were made by Ray H. Manson, vice-president in charge of engineering; Edward A. Hanover, vice-president in charge of manufacturing; George A. Scoville, vice-president in charge of sales, and W. Roy McCanne, president and general manager.

In 1917, a similar banquet was held to celebrate the biggest month up to that time. The business in last October, according to company officials, exceeded that month in 1917 ten times, or an increase of 1,000 per cent.

Banquet Attended by More Than 250 Foremen, Sub-Foremen, Department Heads and Officials of the Stromberg-Carlson Telephone Mfg. Co. Celebrating the Biggest Business Month in the Company's History.

Davey Tree Expert Co. to Broadcast Radio Programs.

Martin L. Davey, president of the Davey Tree Expert Co., is wagering 26 nation-wide radio programs that the people of America prefer old-time melodies to either jazz or classical music. The first program will be heard Sunday afternoon, January 5, 1930, from 5 to 6 o'clock p. m. eastern time, over the Red network of the National Broadcasting Co. It will be followed by a concert each Sunday afternoon until July.

Mr. Davey makes no claim to expert musical knowledge, but he believes that his experience as congressman and as nominee for governor of Ohio last fall has given him an insight into what people want to hear.

"My first purpose in putting on this program," said Mr. Davey, "it to commemorate the golden anniversary of the conception of tree surgery by my father, John Davey. His idea is resulting in the preservation of the beauty of America. It was only natural that I turned to the old-time melodious selections as fitting to the subject. It seems to me that these are what people want to hear, because they stir the heart and bring back fond memories. I encountered so much opposition that I am going through with our type of program as a deliberate test of public opinion."

Experts argued that a radio program should be predominately classical or jazz. Mr. Davey's answer was that not enough of classical music is melodious, and that jazz is a temporary craze of which the public has become weary.

Of the 13 musical selections on each program, 10 will be old-time melodies and three will be taken from classics or semi-classics. Not one jazz number will be heard through the entire 26 weeks. Another unusual feature is the dominance given to the pipe organ, which will be heard with every selection.

Stromberg-Carlson Branch Managers Meet at Rochester.

Thirty-five branch managers, officials and representatives of the Stromberg-Carlson Telephone Mfg. Co., representing the United States from coast to coast, held a business meeting December 17 at the Stromberg-Carlson plant in Rochester, N. Y. The sessions of the conference were all held in the plant and a luncheon was served in the plant dining room. A dinner and meeting were held at the Genesee Valley Club in the evening.

Out-of-town managers who attended the meeting were: Benjamin Gross, H. A. Brennan, L. L. Spencer, Gross-Brennan, Inc., New York City; R. Davis and C. J. Hunt, Davis-Hunt, Inc., Philadelphia; J. E. McCauley and A. B. Crawford, McCauley-Crawford, Inc., Pittsburgh; C. E. Hesston, Cincinnati; N. W. Baldwin, Toronto; C. W. Schafer, Paul Meyers, A. C. Barg and Everett Worthington of Chicago; C. D. Kinne, Kansas City; O. C. McCanne, St. Louis; R. G. Bookless, Garnett Young & Co., Los Angeles; F. C. King, Scoville Mercantile Co., Atlanta, Ga., and L. A. Randall, Baltimore.

The Rochester officials and representatives present were: W. R. McCanne, president and general manager; George A. Scoville, vice-president in charge of sales; E. A. Hanover, vice-president, in charge of production; Ray H. Manson, vice-president, in charge of engineering; B. Woodbury, special representative; E. A. Reinke, chief sales engineer; W. T. Eastwood, advertising manager; E. R. Stonaker, consulting traffic engineer; J. S. Gibson, radio manager; D. W. Brown, manager Rochester sales; F. K. Cannon, export manager; J. W. Kennedy, Rochester sales department; F. N. Anibal, special representative in Rochester; S. H. Hanford, L. A. Cassler, F. B. Farley and R. C. Reno, of Lyddon, Hanford & Kimball.

Advertising Service of United Trust Co., Abilene, Kans.

The United Trust Co., public utility department, Abilene, Kans., has acquired the advertising service for operating telephone companies formerly conducted by TELEPHONY.

The director of this new advertising service has charge of the department which handles advertising for a number of the United telephone companies operating in several states, and is well qualified to serve patrons of TELEPHONY's former advertising service.

The advertising pieces and newspaper advertising campaigns produced for the various United companies are afterward syndicated and offered at a low cost to other Independent telephone companies throughout the United States and Canada.

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Lawrenceville, Illinois

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Tentative Agreement Reached on Length of New Chicago Franchise.

Attorneys for the Illinois Bell Telephone Co. and members of the Chicago city council telephone franchise subcommittee on December 20 came to a tentative agreement on the clause in the new franchise which deals with the length of the contract between the city and the company. The new franchise, by this agreement, is to run for 23 years with the possibility that it may not terminate at the end of that period.

The provision is so worded that at the end of 22 years the city must give 12 months' notice if it wishes to end the franchise at 23 years. If neither the city nor the company gives notice of a desire to terminate the franchise, it will continue to run indefinitely. After the 23-year period, however, it can be terminated a year after notice is given by either party.

"This provision gives the benefits of both a term and an indeterminate franchise," said Ald. Jacob M. Arvey, chairman of the council gas and oil committee. "I believe it is an excellent solution of the problem formerly presented by the company's stand for an indeterminate franchise."

Some concessions have been obtained by the city council committee from the telephone company in the negotiations thus far carried on. The company has agreed on free service for the city in connection with the police and fire departments. This involves a large financial saving to the taxpayers.

Another item of interest to property owners is the agreement on the part of the company to install manholes and conduits before new streets are installed, providing sufficient notice is given of the intentions to lay new streets or pavements. This will prevent streets from being torn up immediately after pavements are laid.

Company at Warsaw, Ind., Fails to Secure Injunction.

The Commercial Telephone Co. of Warsaw, Ind., failed in its effort to obtain an injunction against the Northern Indiana Telephone Co. when Judge L. W. Royse in Kosciusko circuit court sustained a demurrer to the complaint.

The Warsaw company sought an order of the circuit court requiring the Northern Indiana company to route toll business between Warsaw, Atwood, Etna Green and Bourbon and between Warsaw, Claypool and Silver Lake over the lines of the Commercial Telephone Co.

The two companies have parallel lines between these exchanges but the Commercial Telephone Co. claims that years ago an agreement was entered into whereby all toll business originating in any of these places must be routed over the Commercial company's lines.

A similar petition is on file with the Indiana commission and the action in the Kosciusko circuit court was taken in an effort to obtain a ruling pending the outcome of the service commission petition.

Increase Order of Terre Haute (Ind.) Company Revamped.

An increase in rates of the Citizens' Independent Telephone Co., Terre Haute, was authorized recently by the Indiana Public Service Commission. The increase will total approximately $96,000 annually.

Although the entire commission agreed that an increase was necessary, Commissioners Calvin McIntosh and Frank Singleton, differed with the majority members on the amount. Mr. McIntosh had handled the case and his valuation of properties was considerably lower than that finally accepted by the commission.

The fair valuation was placed at $3,000,000, on which the company will be allowed a 7 per cent return.

Among the new rates are the following: Individual business, $7.75; two-party business line, $6.50; individual residence line, $3.75; two-party residence line, $3.50; party residence line, $2.25; rural business $3.50, and rural residence line, $2.25.

Present rates for business lines, single and two-party, are $6.25 and $5.25 respectively. Present residence rates are: Individual, $3, two-party, $2.50 and four-party $2.25.

An opinion that the order as finally written by John W. McCardle, chairman of the commission, grants rates which are "unduly high and work an unwarranted hardship on the public," was released by Commissioner Frank T. Singleton a few days after the granting of the increase.

Mr. Singleton said the valuation allowed by Mr. McCardle is $404,736 in excess of a fair value on the company's property and that rates and tolls established by Mr. McCardle will give the company $66,672 in excessive returns each year.

Calvin F. McIntosh heard the case and wrote the first order. His valuations were too low to suit Mr. McCardle and Commissioners Howell Ellis and Jere West, so he was directed to rewrite the order, giving a higher valuation and higher rates. When Mr. McIntosh had completed his second order, Mr. McCardle rewrote that one.

Commissioner Singleton pointed out that Mr. McCardle's order has granted the Terre Haute company a $20,000 excess for cash working captal, $184,736 excess for work in progress and $200,000 excess for going concern value. He declared that the company had violated regulations of the public service commission by having used its depreciation reserve fund for other purposes.

Majority members of the commission on December 20 rescinded the rate increase order and passed another which John W. McCardle, chairman, had revamped.

Mr. McCardle claimed that the latest order "does not change the rates." This means the $96,000 increase will remain in the order in spite of statements by Commissioner Frank Singleton, that they are based on nearly a half million dollars of excess valuation. The order was not signed by two of the members.

Kentucky Commission Denies Petition Asking Connection of Lines.

The Kentucky Railroad Commission recently dismissed a petition of the Northern Kentucky Mutual Telephone Co., Brooksville, Bracken county, which sought to compel the Southern Bell Telephone & Telegraph Co. to afford connection with its lines for the interchange of messages between Augusta and Germantown and points south, southeast and southwest of Mt. Olivet.

The petition was dismissed, the commission said, because there is no public demand at Augusta or Germantown for additional toll facilities.

Missouri Commission Approves Issue by Southwestern Bell.

The Missouri Public Service Commission recently authorized the Southwestern Bell Telephone Co. to issue and sell $15,000,000 of common stock, the proceeds to be used in reimbursing the treasury and in repaying advances by the American Telephone & Telegraph Co., for additions, extensions and improvements.

The authorized 150,000 shares of additional common stock are to be sold at not less than par value of $100 a share, under terms of the order. The stock is to be sold before June 30, 1930.

The order provides that $11,500,000 of the proceeds of the stock sale are to be used to repay money advanced by the par-

ent company, on notes of the Southwestern Bell, and $3,500,000 to provide funds to pay for construction work to be completed by the end of this year.

The company submitted evidence that it expended $20,977,345 for construction and plant additions from November 1, 1928, to last October 31, and that work in progress would cost $3,000,000. The improvements were in the entire territory of the Southwestern Bell company, which includes Missouri, Arkansas, Kansas, Oklahoma, Texas and part of Illinois.

Michigan Commission Approves Purchase by Bell Company.

Purchase by the Michigan Bell Telephone Co. of several small telephone lines and exchanges in and around the village of Leland, Leelanau county, was approved recently by the Michigan Public Utilities Commission.

Among the smaller lines which are to be sold to the Bell company are the Leland Roadway telephone line No. 2 and Leland Roadway No. 6.

The Michigan Bell company was also granted permission to purchase the Beaverton exchange in the city of Beaverton, Gladwin county, and extend its rural line rate schedule to the Lake Leelanau exchange.

Two Oklahoma Commission Hearings Postponed Indefinitely.

The general hearing before the Oklahoma Corporation Commission involving the investigation relating to rules and regulations governing ownership of telephone equipment by telephone companies, which was docketed to be heard December 17, has been indefinitely postponed.

Hearing on the application of the Ketchum Hotel vs. the Southwestern Bell Telephone Co. for authority to install its own P. B. X. board and to fix rates for trunk lines, which was set for the same date, has also been postponed indefinitely.

Company Asks Approval of Change to Metallic Circuit Service.

The Lincoln Telephone & Telegraph Co. has applied to the Nebraska State Railway Commission for authority to change from grounded to metallic service and to increase charges for business service from $2.25 to $3.00 a month; residence from $1.50 to $2.00 and rural from $1.50 to $1.75, the latter being the standard charge as determined by the commission in past orders where metallic service has been substituted. The company advises the commission that the patrons will be canvassed in due course of time as to their wishes in the matter, and the commission will be later informed if they desire the higher type of service.

More than a third of the company's exchanges are being operated on too low a rate basis, and each of these is being taken up in turn. They are all small-town exchanges, many of them giving the grounded service, installed when they were started as local community enterprises. The gridironing of the state by transmission line wires is making grounded service more and more unsatisfactory, and in the reconstructing of the exchanges it has been found possible to secure the consent of about three-fourths of the subscribers to higher rates for the better service.

A quarter a month more for better service is no longer regarded as an unjust rate in farmer circles, although a number have been found who would rather put up with unsatisfactory service than contribute more for efficient service.

Authority Granted by Wisconsin Commission to Issue Notes.

In a recent certificate of the Wisconsin Railroad Commission, authority was granted to the Peoples Telephone Co. of Mount Hope to issue $20,000 principal amount of its five year 6 per cent notes dated February 1, 1930, for the purpose of securing funds with which to retire $14,900 of short-time notes payable, $2,500 of first mortgage indebtedness against certain real estate owned by the company, and also to provide $2,600 to pay for net additions and extensions to its property and plant and all for purpose property chargeable to capital account.

The company has a total of $9,600 of capital stock now outstanding and a book value of property of $44,361.95 as of October 31, 1929.

Company Held Liable for Injury to Frightened Animal.

The Court of Civic Appeals of Texas, in the case of West Texas Utilities Co. v. Haynes, 20 S. W. (2d) 236, held that the company constructing a telephone line along a highway was liable for an injury to a mule which became frightened at spools of wire.

The company was constructing a telephone line along a highway near the farm upon which Mrs Haynes resided. At the close of the day's work the telephone employes left two spools of wire near the traveled portion of the highway, one lying flat in a ditch and the other standing on its end between the ditch and that portion of the highway over which vehicles passed.

Mr. Haynes came along the highway after working hours, taking some mules to pasture. The mules became frightened at the spools and one of them, which was shown not to be easily frightened, became entangled in a barbed wire fence and was cut to such an extent that it was killed. Judgment was entered for Mr. Haynes for the value of the mule. On appeal the company contended that the evidence failed to show any negligence on its part and that if such negligence was shown it was not the direct and proximate cause of the injury to the mule. The judgment was affirmed.

The court held that the question of the company's negligence in leaving the spools near the traveled portion of the highway was a question of fact to be determined by the trial courts, and that the fact that the company was constructing its line along the highway by authority of the commissioners' court was immaterial; authority to construct a telephone line along a highway was not a justification for negligence in the method of its construction.

The evidence supported the finding that the company's negligence was the proximate cause of the injury, the court stated.

Wisconsin Company Granted Permission to Issue Serial Notes.

Under date of December 7, the Wisconsin Railroad Commission authorized the Lisbon Telephone Co. of Sussex to issue $6,000 principal amount of its first mortgage 6 per cent five year serial notes dated November 1, 1929, for the purpose of securing funds with which to retire a first mortgage now outstanding against the property amounting to $1,000 and also for the purpose of bringing the total of its outstanding securities more nearly to an equality with the value of its property.

For the purpose of this case, the commission found that the fair value of the property of the company was $14,500 as of October 1, 1929.

New Jersey Bell Acquires Property in That State.

The New Jersey Bell Telephone Co. was recently authorized by the Interstate Commerce Commission to take over the properties of the Middlesex Telephone Co., which operates an exchange at Monmouth Junction, N. J., which serves approximately 250 subscriber stations and 7.5 pole miles of toll lines.

On March 8, 1929, the Bell company contracted to purchase the physical properties of the Middlesex company for $40,000. The properties are subject to a mortgage indebtedness of $2,700, and the other liabilities of the Middlesex company total about $1,800. These liabilities will be deducted from the purchase price and assummed by the Bell company.

An appraisal made by the inventory and costs engineer of the Bell company found the reproduction cost new of the properties to be $58,131, and less depreciation $43,922. The estimated value of property to be retired from service, due to deterioration and inadequacy, is $5,130, and the cost of removing the retired property is expected to exceed its salvage value by $390.

In 1928, operating revenues and operating expenses of the Middlesex company were $14,959.46 and $9,511.56, respectively.

The Bell company will, upon acquiring

(*Please turn to page* 43.)

Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

New Incorporations and New Telephone Companies.

SEYMOUR, IND.—Articles of incorporation have been filed with the secretary of state in Indianapolis by the Southern Indiana Telephone & Telegraph Co. with a principal place of business at Seymour. The papers are in the nature of a reincorporation to come under the last corporation statutes of the state. The company shows a capital stock of 10,000 shares having no par value common and 2,000 shares of preferred stock with a par value of $100 each. The company operates several exchanges in southern Indiana. The directors named are Lon C. Griffitts, John F. Kent, Hardin H. Carter, Elbert S. Welch and Cullen B. Barnes.

THIEF RIVER FALLS, MINN.—A new telephone firm to be known as the Riverside Telephone Co., has been organized by a group of farmers living east of here, on the north side of Red Lake river. The Carl Hillard, Elev Aakre, C. M. Hoverstad and O. F. Mellby farms will be served by the new line. Mr. Aakre is secretary of the company.

BRUCETON MILLS, W. VA.—The Bruceton & Kingwood Telephone Co. has been incorporated with a capital of $5,000 by Jeremiah Thomas, Ray Hinebaugh, C. T. Collins, L. F. Silbaugh, H. M. Wolfe, Walter Collins, H. C. Glover, C. F. Spiker and F. M. Cunningham, Bruceton Mills; S. R. White and Noah Thomas, Brandonville, W. Va.; H. P. Moyer, Clifton Mills, and J. E. Jenkins, Albright, W. Va.

Financial.

WARWICK, N. Y.—At a meeting recently of the directors of the Warwick Valley Telephone Co., Secretary-Treasurer John E. Barry submitted details of gross and net revenues for the first nine months of the year, which showed an increase over the same period of the preceding year. A semi-annual dividend of 2 per cent was voted, payable January 1.

Elections.

PROPHETSTOWN, ILL.—George Aylsworth was re-elected president of the Prophetstown Mutual Telephone Co. at a meeting recently. All the other officers were re-elected as follows: Vice-president, George Merrill; secretary and manager, F. L. Dudley. Other directors, elected last year, are Harry Lineweaver and Ed Oberle. A financial statement was submitted by the board of directors and approved by stockholders. No important changes are planned for the next year, it was reported.

BRANDON, IOWA—The Brandon Telephone Exchange stockholders recently elected directors for the year and the board will meet soon to appoint officers to succeed Ray Albert, president for the past two years, and George Finley, secretary. The new board of directors includes: J. W. Elliott, Fred Hoffman, M. S. Vannote, J. F. Naylor, F. E. Albert, Dr. E. C. work and F. N. Nabholz.

WATFORD CITY, N. D.—At a recent meeting of the Watford City Telephone Co. here, Con Sax was elected president; Frank Keogh, vice-president; O. K. Holm, treasurer, and C. C. Mogen, secretary.

Construction.

SAN FRANCISCO, CALIF.—Contemplated expenditures of $333,000,000 in new construction in the next five years, $65,000,000 of it in 1930, was announced here recently by the Pacific Telephone & Telegraph Co.

MONTREAL, QUE., CANADA.—The Bell Telephone Co. of Canada expects to install 250,000 telephones in the provinces of Ontario and Quebec during the next five years, and to spend $160,000,000 on extensions and replacements, it is stated.

CHICAGO, ILL.—At the November meeting of the board of directors of the Illinois Bell Telephone Co. an expenditure of $1,457,942 for new plant in the city of Chicago, and $652,895 for Illinois outside of Chicago, making a total of $2,110,837, was approved. The total approved for this year is $32,880,151.

ENFIELD, ILL.—The Illinois Commercial Telephone Co. plans to spend approximately $15,000 in reconstructing and replacing present equipment in Enfield.

Work has already begun under the direction of O. W. Fullerton of McLeansboro.

Over 10,000 feet of cable will be strung within the city limits, doing away with many of the old open lines. Present switchboard equipment will be rebuilt.

A new copper circuit will connect Enfield with Carmi and McLeansboro, while another new line will be laid along Route 14 from McLeansboro to Benton, eliminating the present necessity of switching through Mt. Vernon.

RICHMOND, IND.—The Richmond Home Telephone Co. has a four years' construction program totaling an expenditure of about $200,000 for installing underground conduits and other improvements, and thereby lies a story. In order to further President Hoover's plan for stimulating business in 1930, officials of the company have issued a statement that in 1930 two

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years instead of one year of the program will be completed. Materials have been ordered.

MADRID, IOWA—The Iowa State Telephone Co.'s crew of men has finished the improvements in its plant here after three months of work.

The improvements have been installed at a cost of several thousand dollars, and include 12,000 feet of new cable and 80,000 feet of new drop lines. Of the new cable around 8,000 feet were placed underground, and about half of the 12,000 was in new work. The other half was replacement.

The work is in line with the general policy of the company to bring its telephone properties up to a modern standard in order that better service may be rendered patrons.

BOSTON, MASS.—At its regular monthly appropriation meeting December 17, the executive committee of the New England Telephone & Telegraph Co. approved the expenditure of $2,290,951 for new construction and improvements in plant necessary to meet the demand for service. Including this authorization, the total commitment of the company for plant expenditures this year is $37,259,532.

For Maine the appropriations aggregate $884,558; for New Hampshire, $153,172; for Vermont, $42,147; for Massachusetts, $1,069,887; for Rhode Island, $141,187.

Of the amount authorized $800,680 will be expended for central office equipment, $398,448 for exchange lines, $61,801 for toll lines, $49,634 for buildings, $5,296 for station equipment, and $975,164 to cover the total cost of hundreds of routine additions to plant in all parts of the company's territory during January.

ERIE, PA.—A $170,000 structure, housing offices, a garage and storage room is to be erected by the Mutual Telephone Co. at Sixteenth and Cranberry streets. The building is to be of brick, steel and concrete construction.

The building, to be 200 by 200 feet, will provide storage for 70 automobiles, will have stock, store, and paint rooms, as well as locker, showers and office rooms.

Miscellaneous.

INDIANAPOLIS, IND.—A number of Independent telephone companies in Indiana have filed papers with the secretary of state here evidencing the preliminary dissolutions of the corporations. They are: North Salem Telephone Co., North Salem; Rossville Home Telephone Co., Rossville; Flora Telephone Co., Flora; Chalmers Telephone Co., Chalmers; Advance Telephone Co., Advance; Monticello Telephone Co., Monticello, and the Moran Peoples Telephone Co. of Moran, Ind.

NOBLESVILLE, IND.—At a banquet held recently in Noblesville, of employes of the 35 telephone companies of the Max Hosea interests in central Indiana, $1,200 was distributed in bonuses. The banquet was attended by employes from Noblesville, Covington, Amboy, Converse, Center, Carmel, Zionsville, Greentown, Greenfield, Whitestown, Sheriday, Largo, Veedersburg and Morgantown.

DIXON, ILL.—The Dixon Home Telephone Co. has announced that, effective December 1, all free tolls to various towns were discontinued except to Harmon. The free service has been allowed to the local subscribers calling Ashton, Franklin Grove, Paw Paw, West Brooklyn, Sublette, Lee Center, Amboy and Harmon, but a toll of ten cents is now charged for station-to-station calls and 20 cents for person-to-person calls to the above towns, except Harmon, which remains on the free list.

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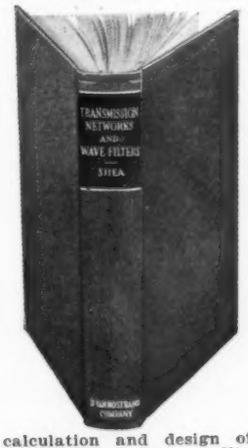
Member of the Technical Staff, Bell Telephone Laboratories



The calculation and design of telephone networks and wave filters are fully presented in this book, written by Mr. T. E. Shea of Bell Telephone Laboratories. It embodies the most recent developments in this field as well as the standard practice. "The Telephone Equipment of 1929," "The New Science Telephony," "Transmission Networks and Wave Filters" and "Radio Broadcasting Engineering" are a few of the subjects capably discussed in this valuable book.

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The Dixon Home Telephone Co., expects soon to make a new department to handle these county calls only. When this is completed all the county calls will be relayed to a county board and will not have to be handled through long distance. This will speed up the service, both on county and long distance calls.

ERIE, ILL.—Kirk Thompson, the former manager of the Crescent Telephone Co. of this city and Mrs. Thompson, were given a farewell dinner recently by employes of the system. They left later for St. Petersburg, Fla., where they will spend the winter.

CAYUGA, IND.—Mr. and Mrs. J. E. Russell, who for the past 32 years have operated the Cayuga Telephone Co. exchange, have sold the property to Clyde Beers, Clayton, exchange operator, for a reported consideration of $12,000. The exchange has over 200 subscribers and Mr. Beers plans to enlarge the system. There will be no change in personnel of the present staff, he announced. "Sonnie" Mathis continues as mechanic and lineman, a position he has held for several years.

HEBRON, IND.—The Hebron Telephone Exchange has changed hands after 13 years of the present management.

John Bruner of Rensselaer who was owner 13 years ago, has again purchased the property. Frank Bruner, brother of the owner, will come from the Rantoul Telephone Co., Rantoul, Ill., to take charge of the south county exchange.

L. F. Porter, present manager, has announced no plans for his future employment.

It is rumored that upwards of $30,000 were involved in the deal.

WELLSBURG, IOWA—Differences between patrons of rural lines in this community and the Wellsburg exchange have been adjusted and service on seven lines, which had been disconnected the past several weeks, was resumed.

These rural lines had been denied service since in September when patrons objected to the $2.50 advance in tariff but the patrons agreed to accept the price, paying the $5 toll semi-annual annually, according to Mrs. O. B. Eels, manager of the Wellsburg exchange.

The resumption of relations marks the end of the proposal to establish an Independent line serving the rural district. A temporary organization had been started in line with a policy of incorporating rural lines by groups to combat the Central Iowa Telephone Co. which operates the local exchange, but this has been abandoned.

PHILADELPHIA, PA.—Stockholders of the Bell Telephone Co. of Pa., will meet on December 28 to vote on purchasing all outstanding stock on the Lehigh Telephone Co., of Hazelton, at $100 a share and on a proposed amendment to the by-

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laws increasing the board of directors from 15 to 17 directors.

BRISTOL, TENN.—The national trend toward group life insurance is further evidenced by the fact that additional protection has recently been acquired by the Inter-Mountain Telephone Co. and subsidiary companies, of Bristol. The policy covers 152 lives, the total amount involved being $446,000.

The policy is of the contributory type, the workers and the employing company sharing in the payment of the premiums, and each worker is insured in amounts ranging from $2,000 to $8,000, according to the rank or position held.

MONTELLO, WIS.—The Marquette Telephone Co., owned by Maurice Cotter of this village, has merged with the Commonwealth Telephone Co., of Madison. The local office will be under the same management as at the present time. The lines in the village will be all rebuilt with metallic circuits, it is stated.

PLATTESVILLE, WIS.—At the annual meeting of the board of directors of the Plattesville, Rewey & Ellenboro Telephone Co., it was found that the company had transacted the best business in 1929 since it began operations and the funds on hand warranted the payment of the usual $10 dividend per share on par stock of $20. This is the fourth year the company has paid $10 per share.

At a meeting held one year ago it was voted to reserve each year $1,000 for a building fund to be used in the building of a new exchange.

Additional improvements are planned in the line. The village of Livingston will be connected up with the main line of the Plattesville company. A small toll charge will be made for service between Plattesville and Livingston.

WHAT THE COMMISSIONS ARE DOING.

(*Concluded from page* 39.)

the properties, place in effect a comprehensive plan for improving operating conditions at Monmouth Junction and neighboring cities.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

December 16: The Campbell Telephone Co., operating in the town of Campbell and vicinity, Santa Clara county, authorized to place in effect on January 1, 1930, increased rates, producing approximately $1,050 additional revenue per year, the present rates being found insufficient to produce a fair return. The new rates will provide for a four-party line service, not heretofore rendered, and will eliminate the $1 fee for the restoration of service disconnected for non-payment of bills.

December 17: Permission granted to the Northern California Telephone Co. to sell its properties to the Pacific Telephone & Telegraph Co. for a nominal consideration, the Pacific company having already acquired all of the outstanding capital stock of the Northern company. The properties of the acquired company in Colusa, Glenn, Lake, Mendocino, Napa, Sonoma and Tehama counties will be merged with those of the Pacific company and operated by the latter company.

KANSAS.

December 13: Aurora Telephone Co., Aurora, granted permission to place in effect a schedule of increased rates.

December 13: Application granted of the Lost Springs Mutual Telephone Co. for permission to make changes in rates for service at Lost Springs. The following schedule of monthly rates was allowed: Individual line business, $2; individual line residence, $1.50; two-party line business, $1.75; two-party line residence, $1.25; four-party line business, $1.75; four party line residence, $1.25; rural multi-party line business $2; rural multi-party line residence, $1; rural individual business, $2; rural individual residence, $1.

MINNESOTA.

January 8: Hearing in the matter of the application of the Tri-State Telephone & Telegraph Co. and Webster Farmers Telephone Co. to discontinue the furnishing of free service between subscribers of the Northfield exchange of the Tri-State company and subscribers of the Webster Farmers Telephone Co. at Webster, Lonsdale and New Market exchanges. Hearing formerly set for December 18.

December 17: Tri-State Telephone & Telegraph Co. authorized to place in effect as of January 1, 1930, the schedule of toll rates for intrastate service within the state of Minnesota as shown in Exhibit "B" attached to the application.

December 17: Northwestern Bell Telephone Co. authorized to place in effect as of January 1, 1930, the schedule of toll rates for intrastate service within the state of Minnesota, as shown in Exhibit "B" attached to the application.

December 28: Hearing in the matter of the petition of the Dayton Rural Telephone Co., Dane Prairie & Buse Line, Friberg Rural Telephone Co., Orwell-Buse Telephone Co., Aurdal Telephone Co., Western Cooperative Rural Telephone Co., Fergus & Jewett Lake Rural Telephone Co., Wall Lake Telephone Co. and Aastad-Buse Telephone Co. to obtain a lower telephone connection fee for switching service now being rendered by the Northwestern Bell Telephone Co. from its Fergus Falls exchange to the petitioning companies named.

MISSOURI.

December 17: Application granted of the Southwestern Bell Telephone Co. to issue 150,000 shares of common stock, which must be sold at par. It is expected that part of the funds will be used to reimburse the American Telephone & Telegraph Co. for advances of $11,500,000, while the balance will be devoted to complete additions and betterments now in process.

January 13: Hearing at Kirkwood in the matter of the complaint of E. M. Dierl, Kirkwood, vs. the Southwestern Bell Telephone Co. for overcharge of telephone service.

NEBRASKA.

December 14: Application filed by Lincoln Telephone & Telegraph Co. for authority to substitute metallic for rural and town service at Guide Rock exchange, and to increase rates accordingly.

December 14: Application filed by Northwestern Bell Telephone Co. for authority to establish rural metallic rate of $2.50 gross at Clarkson exchange.

December 15: Application filed by the Beaver Valley Telephone Co. for authority to cancel a rate of $1.50 a year for extension bell service and to substitute therefor a charge of 25 cents a month; for permission to charge 25 cents a month extra for desk sets and to cancel the ten-cent rate for non-subscriber calls at its exchange at Danbury.

SOUTH DAKOTA.

December 7: Central West Public Service Co. of Omaha, Neb., authorized to increase its rates at Toronto, Clear Lake, Gary, Elkton, Estelline, and White.

Keeping Faith
with THE PUBLIC

MAINTAINING the finest service possible is but the every day duty of a telephone company in carrying out its contract with the public.

"Keeping faith" simply means "use good judgment in the selection of your equipment."

STORM KING batteries have developed a new insulating material, more highly absorbent than any other, which will retain the chemical solution much longer than anything so far developed. The result is the longest service life ever developed in a telephone battery and this in turn means substantial savings to telephone companies in cutting down renewal costs to a new low point.

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Kellogg magneto desk sets with inside connection New cabinet signal sets, 3-bar 1000 or 1600 ohm @ $10.00—4-bar $10.75—5-bar @	$11.50
Am. Elec. Burns Express drops and jacks @	1.50
Swedish Am. 5-bar 1000 or 1600 ohm Bdg. compacts @	7.50
Western Elec. No. 20 C. B. Ind. Coils @	.35
Automatic Elec. 2-M. F. Condensers @	.30
Monarch 4-bar 1000 or 1600 ohm Bdg. compacts @	7.00
Leich Elec. Co. pole changer, operates off 24-volt Batt. Ckt. @	20.00
H. C. Motor Gen. Ringing machine, operates off 110-volt A. C. light Ckt. @	70.00
Stromberg-Carlson Local Battery transmitters with back @	.90
Kellogg No. 97 C. B. desk sets complete with No. 259 or No. 404 Steel signal sets @	7.00

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FOR SALE—5700 second-hand No. 7-A Fuses, clean, tested and ready for service, for sale cheap. Lincoln Telephone & Telegraph Company, F. M. Strasser, Supervisor of Supplies, Lincoln, Nebraska.

WANTED

WANTED—Will trade 600 acres land, improved, near large city, soon ready for development, for telephone property. Address 7648, care of TELEPHONY.

POSITIONS WANTED

WANTED POSITION — Telephone man who knows his work and is not afraid to do it, wants position. Can best qualify as wire chief, trouble-man, installer, line man, or any combination of these. Years of experience on magneto and common battery, local and toll, outside and inside. Some automatic experience. References furnished or will come on trial. Go anywhere—reasonable salary. Address 7621, care of TELEPHONY.

POSITION WANTED—General or district manager of group of exchanges; 31 years' experience; technical education. Will consider leasing an exchange with privilege of buying. Address 7640, care of TELEPHONY.

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2 conductor stand cords	$ .25
3 conductor stand cords	.35
4 conductor stand cords	.45
5 conductor stand cords	.55
Kellogg No. 26-D operator's cord	.35
Kellogg No. 67-D operator's cord	.55
Kellogg No. 239 operator's cord	.55
New Western Electric Co. green, red or white 2 conductor switchboard cords for S.C. No. 57 plug, 72-inch	.35

Buckeye Telephone & Supply Company

1432 S. Parsons Ave. COLUMBUS, O.

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FOR SALE—Cook No. Ten Arrestors, perfect condition, complete with heat coils and carbons, 20 pr. banks, $3.50 each. Sample for approval. WHITTIER HOME TEL. & TEL. CO., Whittier, California.

FOR SALE—4 positions Western Electric Co.—1248 Common Battery Lamp Switchboards, equipped for 740 lines. One of these positions equipped with 15 pr. Universal Toll and Local Cord Circuits.

1 Mercury Arc Rectifier, 10 Amp. capacity.

1 Gasoline-Generator Set—24-36 volt—20 Amp.

75 No. 294 Western Electric Co. Sub-Sets, less receivers.

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FOR SALE—Telephone plant 400 stations. Income $8000. 7-room modern house included, $35,000 if taken soon. $20,000 will handle. Address 7635, care of TELEPHONY.

FOR SALE—Several small exchanges. Bargains. E. W. Rollins, Hall Street, Spartanburg, S. C.

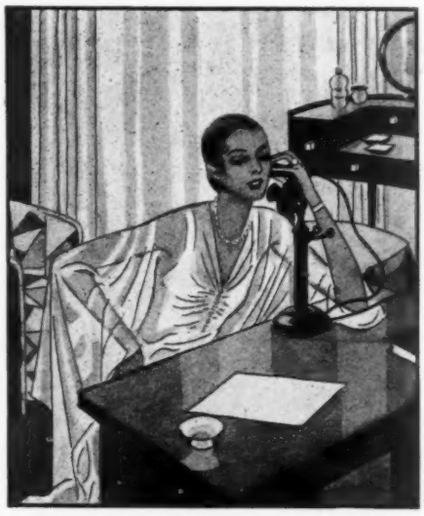
MODEL HB BUDA-HUBRON EARTH DRILL powered with 12 H.P. air cooled gas engine. Mounted on Trailer. Cost $1575.00 new and is approximately one year old. Used three months. Will sell cheap. The R. C. Huffman Construction Co., 556 Terminal Tower, Cleveland, Ohio.

FOR SALE—535 stations, income $10,000.00 and net tolls $2000.00; graveled roads both ways through property, 30 miles Kansas City. $80.00 per station. $16,000.00 cash, balance terms. Address 7647, care of TELEPHONY.

FOR SALE—Switchboard, 300 drop, Dean board, fully equipped, and a 150 drop Dean board with 75 equipment. Will take $375.00 for both. S. G. Smith, Alpine, Texas.

FOR SALE—An exchange; population fifteen hundred; wonderful opportunity for a young couple; new highway and wonderful beach. Five hundred cash will handle it. O. M. Krans, Quitman, Georgia.

Communication *within* the Home . . . or to the Outside . . . over the same Telephones



MANY HOME BUYERS these days want communication within the house, as well as to the outside . . . bedchamber to kitchen, for instance. Bell System equipment makes it possible to have this intercommunication over certain of their telephones without interfering with outside calls.

This is but one of the features of modern telephone convenience, which is becoming so popular throughout the country. The basic idea is to have *enough telephones*—conveniently placed to give complete ease and comfort in the use of telephone service.

Builders find it a strong selling aid to provide for this telephone convenience, by placing conduit within the walls of a house during construction. Telephone outlets are made available in nearly every room. The home buyer can then have telephone service right where he wants it—with the added appearance which comes from concealed wiring. He can use just those outlets which best meet his requirements.

Your local Bell Company will be glad to plan with you the telephone conduit arrangements for your new buildings. There is no charge for this service. Just telephone the Business Office.

In the above advertisement, appearing this month in magazines edited for builders, the Bell System discusses some of the advantages of providing conveniently located telephone outlets, and telephone conduit, throughout the house.

The seal of approval has long since been given Stromberg-Carlson Junior Multiple Switchboards by exchanges in the smaller communities wishing to modernize their service.

This is due to the fact that Stromberg-Carlson Junior Multiple Switchboards furnish central energy telephone service comparable with that enjoyed by the best big-city exchanges at a cost in keeping with the financial resources of the smaller companies.

Stromberg-Carlson Junior Multi Switchboards utilize central ene telephones within the community it ... thereby effecting a saving for operating company in both the cos instruments and in the cost of batter but allow for the use of magneto t phones in the outlying districts.

Stromberg-Carlson Junior Multiple Swi boards are now made with steel frame secti which provide a continuous face switchbo without wood strips intervening betw sections and an increase in line capacit eight hundred lines.

Stromberg-Carlson engineers will gladly s you descriptive matter explaining why Stromberg-Carlson Junior Multiple Swi board is the ideal telephone switching eq ment for the small office.

Write for Bulletin 134

Pacific Coast Representative
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Portland, Ore.
Seattle, Wash.

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Branch Offices:
KANSAS CITY, MISSOURI CHICAGO, ILLINOIS TORONTO, CANADA

Southern Rep
Scoville Ma
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Atlanta,

Stromberg

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The "STEWART" Cable Tester is the only one that will locate all cases of water in cables as well as shorts, crosses and grounds caused by lightning or high voltage crosses. The current on the armor does not produce tone in the receiver, you only hear the tone on the cable pair.

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Blake Insulated Staples
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4 Sizes. Pat. Nov. 1900

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Addressing Machines
A1.
Ammeters
W1.
Anchors
E4, G2, K1, K4, M6, S10.
Appraisers
P5, U4, W2.
Arms and Brackets (for Holding Telephones)
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Arresters, Lightning (See Protective Devices)
Auditing, Accounting and Systems
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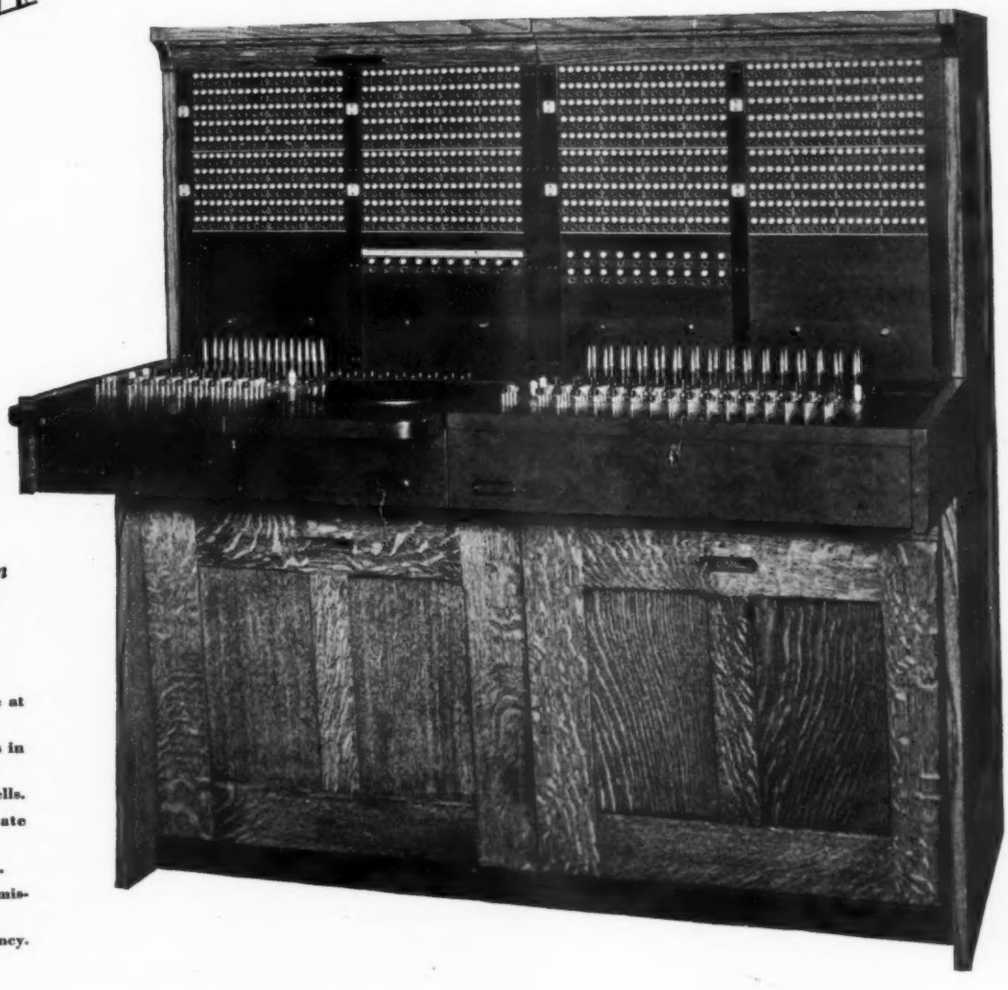
Wrench, Pipe Anchor
K4.
Zinc Meta Arsenite
C13.

The letter with accompanying number indicates the name of advertiser as given in full in the Alphabetical Index to Advertisers.
When making known your wants **to any company listed herein, please mention TELEPHONY.**



romberg-Carlson
Junior Multiple
Switchboard
Installations

ish modern service at
r cost.

t substantial savings in
cost of telephones.

ne expense of dry cells.

ply fast and accurate
vice.

it close supervision.

ide uniform transmis-
n.

se operator efficiency.

Carlson

When writing to Stromberg-Carlson Telephone Co., please mention TELEPHONY.

THIRTY-TWO YEAR

OF SERVIC

IN THE early nineties an engineer had a vision—
dream of countless telephones connecting every hom
every farm and every business in a great network
communication.

In his vision he saw the necessity for a factory—a gr
manufacturing enterprise—one that would turn out la
numbers of telephones, switchboards and equipment
superior design and workmanship.

Dreamers are ofttimes impractical, but not Milo
Kellogg. He built a manufacturing plant that for the p
thirty-two years has been constantly providing the in
pendent telephone field with equipment that insu
improved subscriber service, greater profits and low
operating and maintenance costs.

The Kellogg Company has given to independent te
phony many outstanding developments. One of
greatest of these achievements is the service switchboa
which makes it possible to reduce both plant investm
and operating expenses.

Harmonic ringing was also a feature development
Kellogg laboratories, its perfection resulting in a meth

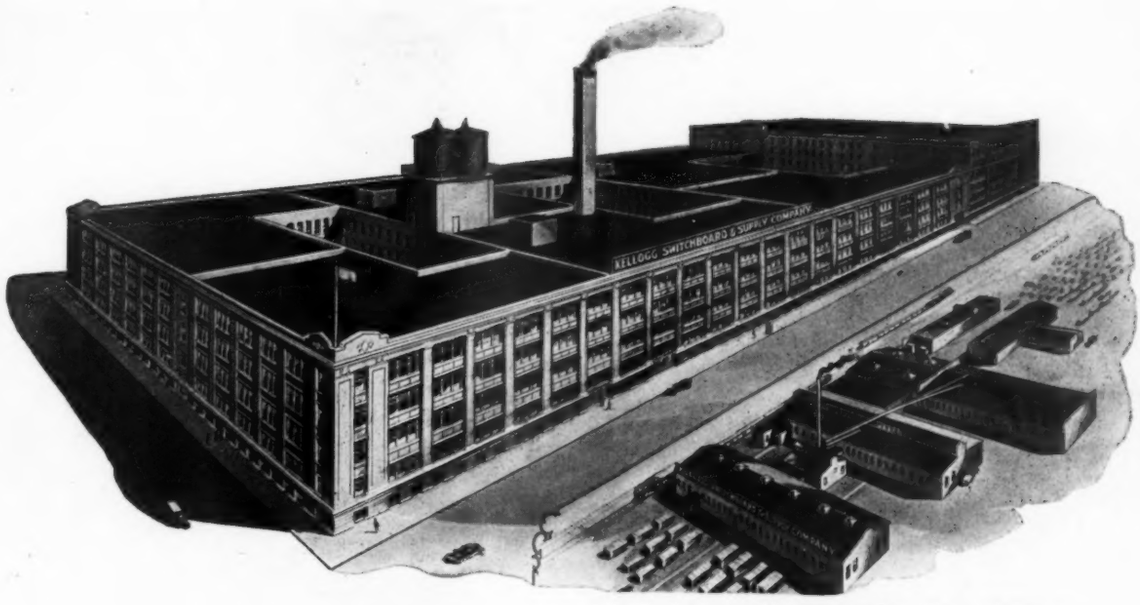
INDEPENDENT THEN
1897

Kellogg Switchbo

1020-10 S
Ch s

Kansas City

Portland



INDEPENDENT NOW
1929

TELEPHONY

or operating a larger number of telephones with decreased utside and inside plant investment.

Another important contribution to telephony is the Kellogg universal switchboard which enables the small xchange owner to give efficient common battery service ithout an excessve initial investment.

The Kellogg Company was the first telephone manufacturer to establish a plant for moulding phenol products, uch as receiver shells and mouthpieces.

Many other inventions and improvements have come ut of the Kellogg laboratories, including the associated ultiple, line lamp recall, instantaneous disconnect, the everse type transmitter, the shaftless generator armature nd non-adjustable ringer, besides countless minor improvements in circuit construction.

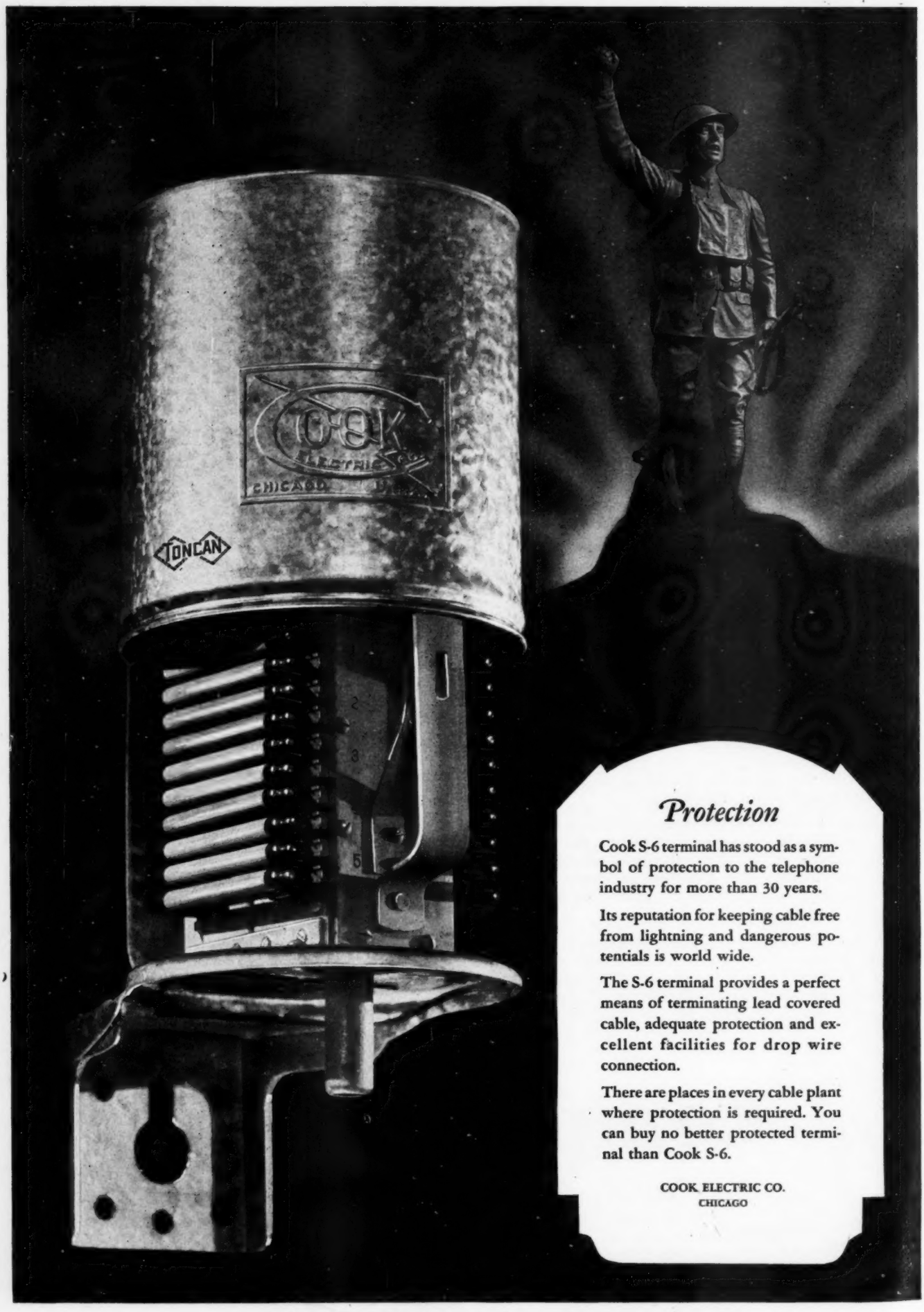
The success of Kellogg telephone products, both here nd abroad, is proved by an increase each year in the umber of Kellogg switchboard installations and the eady growth of the other divisions of the Kellogg elephone business.

Supply Company

Street

Columbus

Shanghai



Protection

Cook S-6 terminal has stood as a symbol of protection to the telephone industry for more than 30 years.

Its reputation for keeping cable free from lightning and dangerous potentials is world wide.

The S-6 terminal provides a perfect means of terminating lead covered cable, adequate protection and excellent facilities for drop wire connection.

There are places in every cable plant where protection is required. You can buy no better protected terminal than Cook S-6.

COOK ELECTRIC CO.
CHICAGO

When writing to Cook Electric Co., please mention TELEPHONY.